The Journal of the American Medical Association

Published under the Auspices of the Board of Trustees.

VOL. XLVII. CHICAGO, ILLINOIS, NOVEMBER 3, 1906. No. 18.

Original Articles

THE ATTITUDE OF THE CLINICIAN IN REGARD TO EXPOSING PATIENTS TO THE X-RAY.*

DAVID L. EDSALL, M.D.

Assistant Professor of Medicine, University of Pennsylvania; Woodward Fellowship in Clinical Chemistry, William Pepper Laboratory of Clinical Medicine.

PHILADELPHIA.

In its relation to medical practice, one of the most remarkable things about the *x*-ray is the tardiness with which there was any realization of its power of producing very marked changes in other tissues than those superficially situated. So large a number of persons have for years been exposed to the action of the *x*-ray that it seems strange, indeed, that, while it is now known to have very decided and sometimes profound constitutional effects, the recognition of such effects by clinicians has come only after years of use, and chiefly because of purely empirical and even haphazard clinical observations. In fact, for some time after it became reasonably evident that it influences the general organism, many persons persistently doubted whether the general effects were actually due to the *x*-ray.

X-RAY AND METABOLISM.

At present this doubt is thoroughly dispelled, for more extended trial with patients and with animals of the clinical effects of exposures, histologic studies of the tissues of human beings and of animals that have been exposed, and investigations of the influence of the *x*-ray on metabolism have all shown that it has in some instances, and particularly on some tissues, a most energetic and powerful effect. In spite of the continued and already extremely impressive accumulation of facts relating to this point, there is as yet, it appears to me, an insufficient appreciation of its importance to clinicians. With agents that are introduced nowadays for diagnostic or therapeutic purposes, it is customary, as a rule, to study the manner of action, to reflect carefully on the character of the cases in which the effects are likely to be useful and those in which they may be harmful, and particularly to determine all these points, as far as possible, by purposeful experiments before such agents are used freely with human beings. With the *x*-ray, on the contrary, the method that has been adopted has been to try its effect for both diagnostic and therapeutic purposes on all manner of conditions, and only gradually, largely by painful experience, to learn that it may have dangerous effects, and seems usually to have noteworthy general effects if the organs active in metabolism are exposed to its influence; while, at the same time, in this somewhat hazardous way, it has been empirically or by lucky chance learned that some general affections are benefited, some are not in any noteworthy degree altered, and some perhaps are harmed.

Partial justification for the risks that have been run may be found in the novel power of the *x*-ray to picture many conditions of the internal organs, when this, of course, had previously been wholly impossible. The manifestly great value of this from a diagnostic standpoint, and the fact that profoundly dangerous effects are unusual and other less dangerous but nevertheless deplorable results of its use are often unnoticed for a long time or have but an inconspicuous relation to the exposure to the *x*-ray, led to a rather natural and wholly humane desire to determine as widely as possible its value in diagnosis; and an empirical study of its therapeutic relations somewhat naturally followed this. It is not surprising that some of the evil results, sterility, for example, were long overlooked, for this effect is not one that becomes apparent readily; and it could with difficulty have been decisively attributed to the *x*-ray, were it not that, the possibility having once arisen, experiment readily demonstrated conclusively that exposures may produce it. The same is true to a less marked degree of nephritis, for this affection may run so silent a course as to have little evident relation to its cause; and, likewise, late toxic reactions, as well as mild and rather indefinite early toxic reactions, are difficult to attribute clearly to the *x*-ray unless attention is carefully directed toward proving this point. Nevertheless, it can hardly be said, I think, that, because its manner of action was unknown, the empirical method of determining which cases were suited and which were unsuited to *x*-ray exposures was necessary, if an agent so evidently valuable was to be used at all. We are not, as a rule, in haste to experiment with human beings in regard to the effects of new drugs until we have determined whether or not they have noteworthy constitutional effects, and, if they have such effects, which tissues in particular they influence; but in the case of the *x*-ray no extensive attempt was made to determine that it had general effects until remarkable results of its empirical use, partly favorable and partly disquieting, demonstrated that it actually has.

That the empirical and not the experimental method of study was first used with the *x*-ray is, I believe, much more largely the fault of those of us who are medical and surgical clinicians than of those who are specialists in the use of the *x*-ray; for, in the first place, the latter, in a large proportion of instances, receive their patients from clinicians for the single purpose of having them exposed to the *x*-ray, the clinician being responsible for its use, while the *x*-ray specialist merely carries out the clinician's orders in a skilful manner, and, in the second place, it is essentially the duty of the clinician, before any measures are recommended by him, no matter who conducts them, to determine or to have determined the main features of its good or bad general effects.

* Read in the Section on Practice of Medicine of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

As has already been stated, we now have sufficient evidence of decided general effects, and there is no longer any question that we should, as far as possible, decide on its use in the same manner as we determine with other agents whether they shall or shall not be employed. It appears to me, therefore, to be of much importance to determine, as far as we may, the general nature of its action, in order that an agent that has already become so valuable, especially in diagnosis, may not have further discredit thrown on it through encountering dangers in its use that might have been avoided by proper study, and in order that its usefulness may be rationally extended into proper channels. A somewhat extensive series of studies of the effect of the *x*-ray on metabolism in various medical conditions that I have made in the last eighteen months, part of which I have described, part remaining as yet unreported, together with some investigations of others on the same point, have shown that the influence on metabolism is, in some instances, most violent; that it occurs even in normal persons, and that apparently when a general influence is clinically evident it is always associated with decided changes in metabolism. These changes in metabolism are due largely, if not entirely, to tissue destruction that occurs chiefly in those tissues rich in nucleoprotein, and they are evidenced most particularly by an increase in the total nitrogen output, with ordinarily a relatively large output of uric acid, purin bases and phosphates, the substances that indicate the degree of nucleoprotein destruction. Extensive histologic studies by various authors, among whom Warthin is most conspicuous in this country, show that the special tissues most severely affected are the bone-marrow, spleen and lymphoid tissues; the effect on these tissues being, indeed, so much more marked than on any others as to be almost specific.

My studies in metabolism have further pointed out some facts that were previously less clear or not at all evident and that are of very considerable clinical interest and importance. For example, they have shown that at times a single exposure of ordinary severity may have a most profound influence on metabolism and one that may show itself for many days afterward. The effect of an ordinary dose may, in fact, be more severe than the effect of a similar dose of any other therapeutic agent with which I am acquainted, and may either be extremely useful clinically or so dangerously violent as to hasten death, and perhaps even to cause it when it would otherwise have been avoided. I would note, also, that in one instance an exposure for an *x*-ray picture, only eight seconds in duration, although actually a moderately severe exposure, produced so striking an effect in one patient (a case of unresolved pneumonia) that he excreted more than double the amount of nitrogen and nearly double the amount of chlorids that he had passed in equal periods previously; the effect in this case having been highly beneficial, but so violent that in some disorders it might evidently have been most dangerous. This point is of interest and importance, in that it demonstrates the possibility of occasional dangerous effects from the mere diagnostic use of the *x*-ray.

Further, I would direct especial attention to the suggestiveness of an observation that I made when studying the metabolism of a case in which a severe toxic reaction occurred. I have the records of three cases in which, after one exposure, there was a reaction so severe as to make the patient profoundly ill, and in two of these cases death occurred, while the third patient had a narrow escape. In only one instance was I personally responsible for the use of the *x*-ray. In two of these cases I was studying the condition of metabolism before the reaction occurred, and I continued the observations afterward, and was thereby enabled to determine that with the reaction certain marked changes occur that had not previously been noted and that help, I think, to make clearer the nature of this disturbance. The special features of metabolism in these cases I have described elsewhere and need not repeat, but the point that I wish to emphasize here is that in one of these cases it was clinically not clearly evident that the *x*-ray exposure produced the severe illness that followed it. Indeed, the careful clinician that had charge of the patient had not considered the probability that it was due to that cause; for the man had been more or less ill for some time, and it was rather naturally supposed that the increased illness was merely an accentuation of the previous condition and that it occurred at the time it did through pure coincidence. But the patient's metabolism showed the same peculiar changes as those seen in another case during what was clearly a severe and almost fatal reaction to an *x*-ray exposure, and I think, therefore, that there is little, if any, doubt that the added symptoms in the man under particular discussion were due to the *x*-ray.

I would also particularly note that this man received an intentional and direct exposure only over one arm from the elbow down; though the trunk was not screened, and hence he undoubtedly got a general exposure which, while distant, was nevertheless an exposure to the deeply penetrating rays. It was, however, mild and was of but five minutes' duration, the intensity of the general exposure having certainly been less than is commonly used in their diagnostic or therapeutic exposures. In addition to this, I would draw attention to the fact that the other patient whose metabolism I studied at the time of the toxic reaction, and who showed profound clinical symptoms and violent disturbance of metabolism, received what Dr. Pancoast tells me was the mildest exposure he had ever given.

It seems to me that the moral to be drawn from these cases is that we must be on the watch for mild or moderate symptoms, as well as for severe ones, after *x*-ray exposures; and must be prepared to determine fairly and justly whether unfavorable symptoms of some degree are not much more commonly due to the *x*-ray than we have hitherto believed and whether their relation to the *x*-ray has not been obscured by pre-existing disorders, which, instead of the *x*-ray, have been held responsible for the increased symptoms. I think most conscientious and conservative *x*-ray specialists already believe that, at least to some extent, this is true, and it appears to me to be highly probable, for, as I have said, even extremely mild exposures may produce very great alterations in metabolism, and it is but natural that this might not uncommonly cause unfavorable symptoms in persons that already had serious disease.

CARE NEEDED IN USE OF X-RAY.

In consideration, then, of the various facts that we have learned in recent years I believe that we should recast our attitude in regard to the use of the *x*-ray even more decidedly than we have done. As far as I am able to judge, the great majority of clinicians look on the *x*-ray, first of all, as an agent that makes valuable pictures and that does good in some diseases; and only secondarily and somewhat distinctly as an agent that has powers for harm and has been known to do harm. The

attitude that appeals to me as a suitable one for the careful clinician to assume is that the *x*-ray is, first of all, an agent that has as active an effect on the organism as has a powerful dose of medicine; that it is not to be used at all, therefore, unless there is some reasonably evident useful purpose in view; that with those that are seriously out of health it is to be used at first tentatively and with brief and mild exposures; that in case fairly definite contraindications can be found to exist persons that present such contraindications shall not be exposed at all, unless cogent reasons for doing so seem to outweigh those to the contrary; and, finally, that the clinician should not order a patient to be exposed to the *x*-ray unless he has taken measures of a simple and reasonable character to determine that there are no easily recognizable conditions present that appear to contraindicate its use, or, if such are present and he still desires to use it, he should acquaint the *x*-ray specialist of the fact of their presence, in order that especial caution may be exercised. Furthermore, the clinician should know that the individual *x*-ray specialist to whom he refers patients protects habitually, as far as this can be done, all parts except those that require exposure, by properly screening them.

These rules may appear somewhat severe, in contrast with the easy freedom with which the *x*-ray has long been used, but I am sure that most thoughtful *x*-ray specialists will agree with me that they are, in the main, proper, and I know that a limited number of clinicians do nearly all these things already. I may seem extreme in having purposely constructed my statements so that they mean that a physician or surgeon should not lightly and without considerable knowledge of his patient have him exposed to the *x*-ray for either diagnostic or therapeutic purposes. I believe that this is a proper attitude, but I would hasten to explain that I do not wish to exhibit or to excite in others an hysterical fearfulness of the *x*-ray or the feeling that the dangers are imminent and ever present. I shall perhaps make myself clearer through an analogy with the use of anesthetics: There are dangers associated with their use, and no one thinks of recommending that they be used unless he has a clearly defined purpose in doing so. Even with persons apparently well, it is a general custom to determine first that the patient is not the subject of any disease that renders the use of an anesthetic possibly or certainly dangerous to a degree that makes one question the wisdom of using it at all with him individually, and if such disease be found and it is still decided to be best to proceed both surgeon and anesthetizer do so with particular caution. Such precautions are taken almost automatically nowadays and no one considers them unreasonably burdensome.

What I have said in regard to the use of the *x*-ray amounts to much the same thing, merely modified somewhat to suit the different conditions. I would not urge that the *x*-ray be used, each time that it is employed, with ponderous and fearful thought of its dangers and that it be used only when one unwillingly feels that he can not escape it; but I would urge that its unnecessary use be discarded, and particularly its repeated use, when one exposure has given all the information that is likely to be gained and when further exposures are undertaken largely from restless diagnostic curiosity. With cases in which rapid diagnosis of fractures or the like is desired, or when a small area is to be treated for epithelioma or other superficial disease, I would not advise hesitation in its use or recommend any especial precautions, except the extremely important precaution of limiting the exposure as carefully as possible to the area that is intentionally exposed. It is, I think, part of the clinician's duty to his patient to determine that the *x*-ray specialist that does the work recognizes the necessity for habitually doing this. Even with robust persons it is desirable, simply because it is always unwise to administer to any one an unnecessary dose that has an active and ill-understood effect on metabolism, and this is still more true if repeated exposures are given. With persons that are already seriously out of health it is even more urgently desirable, as is emphatically illustrated by the case that I have noted, in which a severe reaction followed an exposure of the lower part of one arm, and in which this could probably have been largely or entirely avoided had the other portions of his person been protected.

In cases that require extensive exposures, even though these be only over the extremities, and even though the trunk can be protected, we are treading on somewhat more dangerous ground and should go somewhat more cautiously. I have seen one case of pernicious anemia in which an exposure over the thighs produced a reaction that was the cause of a violent access of symptoms soon ending in death. The bone marrow is known to be one of those tissues that exhibit peculiar sensitiveness to the *x*-ray. Hence, when large areas of marrow are exposed, bad results may readily follow. In healthy persons, the possibilities of harm are so distant that they probably do not deserve very serious thought, but it is desirable that before exposure an examination of the patient, which should include an ordinary examination of the urine and some consideration of the general features of his case, should have furnished evidence that he is reasonably healthy. If he is distinctly out of health, I think that the indications for the use of the *x*-ray, even for diagnostic purposes, should be definite and at least moderately forcible before it is used over extensive areas. If he presents certain forms of disease that I shall mention soon, I think the *x*-ray should be avoided, if possible, and, if it is employed at all, it should be used with great caution and under the stress of urgent indications.

In the case of exposures of the trunk, all I have just said may be applied with some added emphasis. Healthy or moderately healthy persons are not at all likely to be harmed by them, but patients should not have them given in the first instance or have them repeated, unless there is good occasion for doing so, and unless it has actually been determined that these persons are not seriously out of health. With persons whose health is decidedly disturbed, there should be serious consideration of the propriety of extensive exposures before they are undertaken; there should be a tendency to avoid them unless they are very distinctly indicated; and one should have as clear a knowledge as possible of the patient's general condition before ordering the exposure. I have some doubt, even, of the propriety and safety of the use of plates and the fluoroscope in the diagnosis of cardiac and pulmonary disease, in case the patient has much circulatory incompetence or a noteworthy degree of infectious toxemia; and in such conditions I especially question the wisdom of the frequent and often rather regardless use of this method that has not uncommonly been adopted in recent times by enthusiasts. Personally, I use the *x*-ray for diagnosis in both cardiac and pulmonary disease, but I use it only when it seems

especially desirable because other methods are insufficient, and in employing it I try to use well-considered caution.

In bringing together the limitations to be placed on the use of any measure, one escapes with difficulty, if at all, the danger of over-emphasizing the evils. I have tried to avoid this, but, lest I have not succeeded in doing so, I would again insist that my purpose has not been to urge a general restriction of the use of the *x*-ray in all sorts of cases, but rather to plead for its use in a manner that guards, as far as possible, against dangers that are, in occasional instances, known to be great and that are probably not uncommonly encountered in milder and less evident forms. I have, further, desired to urge that occasionally, in cases that past or future experience may lead one to think especially unsuitable, its use should be discarded altogether or should be undertaken only with caution and after a just balancing of the good and evil chances has made the latter appear to be the lesser. I have insisted on caution with all those that are seriously out of health, unless the exposure is limited to a narrow area, and I think reasonable conservatism justifies this view. A certain degree of freedom must necessarily be exercised in deciding which cases require especial caution and much more knowledge and experience will be needed before we can be generally accurate in this regard.

DISEASES THAT SUGGEST SPECIAL DANGERS IN USE OF X-RAY.

There are at present, however, certain points in our knowledge that indicate that the most noteworthy dangers are to be expected in those diseases in which there would be particular difficulty in completely disintegrating and in excreting the products of the tissue breakdown that the *x*-ray causes; and two groups of disorders seem to deserve more careful consideration in this respect than any others with which we are as yet familiar.

One of these has become pretty well known. Clinical and pathologic observation has shown that nephritis may follow *x*-ray exposures, and the enormous increase in excretion that sometimes follows exposure makes it evident that the kidneys are likely to suffer. From the occasional occurrence of nephritis, therefore, as well as from observations on metabolism, we must conclude that with those patients who already have nephritis or those whose kidneys are under especial strain *x*-ray exposures should be guardedly used or excluded.

The other group has been suggested to my mind by the fact that all the cases in which I have seen evidently serious results were already subjects of a considerable degree of toxemia. It would seem highly probable that a person already struggling with a toxemia would be more likely than a normal person to suffer ill effects to his organs of metabolism, as well as to his kidneys, if, in addition to his previous burdens, he were suddenly required to complete the disintegration and excretion of a large mass of broken-down tissues. It appears to me, therefore, that those who are to any noteworthy degree toxic from metabolic disorder or infectious disease should not be exposed without great caution and without urgent reasons.

It is probable that a third group with which we should proceed very cautiously is constituted by those cases that are very anemic. The tissue-destroying effect of the *x*-ray is so largely exerted on the blood-building organs that it might readily cause serious embarrassment if these organs are already insufficient, and I have notes of two patients with pernicious anemia who became profoundly, indeed, fatally, ill after one exposure. On the contrary, I know two patients with the same disease that were benefited, one very greatly and rapidly benefited, by *x*-ray treatment, and it is possible that in some circumstances ordinary doses may destroy or at least seriously damage large portions of the blood-building organs, while in other circumstances the same dose may influence them favorably. It is possible, too, that toxemias may at times be favorably influenced, and it must likewise be admitted that the effect is not damaging in every case of nephritis. Nevertheless, in our present limited state of knowledge, it seems wise to be exceedingly cautious with cases of nephritis, of marked toxemia, and of decided anemia, and particularly with those cases in which there is pronounced anemia in association with a distinctly toxic state. I believe that further clinical, metabolic and other accurate studies of the contraindications, as well as of the indications, for the use of the *x*-ray constitute a valuable field of investigation, and it seems to me to be extremely desirable that clinicians make it a general custom to observe patients very carefully after *x*-ray exposures, in order to determine whether noteworthy after-symptoms seem to be common, even though the patients appear to be doing well under the exposures, and particularly to make careful studies of the urine in a large number of cases. The result of such observation would not be to throw further discredit on the *x*-ray, but to make it possible to use it more rationally and with more logical judgment.

I may not improbably be met with the objection from various sources that as yet there are but a limited number of dangers known to be associated with the use of the *x*-ray and that the number of cases known to have been seriously damaged is small. I think this objection may be met with sufficient force by the statement that the dangers of the *x*-ray have been recognized for only a comparatively short time, and that there has consequently been relatively little opportunity to determine how great and how numerous they are; and that, in spite of this, a very considerable number of cases that have been injured have been described. The histologic studies and the studies of metabolism that have thus far been made make it wholly rational to expect that the dangers are more frequent than we yet know, and the standpoint that appears to me to be wise and proper is not to belittle the dangers and attempt blindly to escape them, but to determine in whatever ways are open to use what they are and how they may be avoided.

THERAPEUTIC VALUE OF THE X-RAY.

I have thus far dealt almost entirely with the points that should limit or discourage the use of the *x*-ray and I have done this purposely because, while these points are still hazy, they are, nevertheless, more definite and demand more immediate attention than those that relate to new indications for its use. Still, as I said earlier, one should have in mind not only the determination and restriction of the dangers, but also the discovery of new channels of usefulness. An agent that has a profound effect on metabolism is not likely to exercise this effect solely in an evil way if proper opportunities for doing good with it are sought out. It is evident already that in leukemia and in some other general disorders metabolism may be stirred up by the *x*-ray to the accomplishing of at least transitory good, and it appears to me probable that some other disorders of metabolism not yet known to be benefited by the *x*-ray might be im-

proved through its use. Up to the present my observations in this direction, which have been limited in number and have been undertaken only in cases that seemed to be proper to subject to exposures, have remained of little or no therapeutic value, except in one condition, in which they have been quite encouraging.

I have had the *x*-ray used in two cases of gout, a disease that has repeatedly been treated in this way. The clinical results in other instances, as well as in these two cases, have, I think, been doubtful or discouraging. The studies of metabolism that I made with Dr. Fife in these two cases, during the time that they were under treatment, showed that the exposures had no influence in stopping or warding off the disturbances of metabolism that are associated with the attacks. Likewise, in two cases of diabetes that were subjected to this treatment no changes of consequence could be demonstrated in the clinical condition or in the excretion of sugar and acetone bodies. I tried the effect of the *x*-ray, also, on a case of persistent headache associated with a deposit of oxalates in the urine, and, while the increase in general metabolism that has usually been observed was noted in this case, there was no change in the amount of oxalic acid that was determined to be present and the clinical condition was not altered.

In several cases of unresolved pneumonia I have had promising results. I used the *x*-ray in these cases because I believe that it probably acts chiefly through increasing the velocity of some ferment processes and because in unresolved pneumonia it is probable that the ferment processes that should and ordinarily do dissolve the exudate are ineffectual. In three such cases the clinical effect was a rapid clearing up of most or all the signs, and in two of these cases in which Dr. Pemberton and I studied the metabolism we observed a tremendous influence that was coincident with the improvement in the physical signs, the metabolic alterations having been of much the same quality and degree as those that are seen at the time of an ordinary successful crisis. These latter results are, then, encouraging. While the others mentioned are not so, I believe that there is certainly constructive work to be done in searching out the therapeutic relations of the *x*-ray, and not simply the more destructive type of work that I have chiefly discussed earlier. I think this is particularly true if the work be planned with the view that this agent has a lively influence on metabolic processes, particularly on those that occur in the spleen, the lymphatic tissues, and the bone marrow, and if it be carried out with a calm but definite appreciation of the restrictions that should be placed on any such experiments in therapeutics.

DISCUSSION.

DR. E. J. BROWN, Decatur, Ill., said that the question of deciding which patients are the best subjects for the *x*-ray is one very difficult to answer. He did not know of any criterion by which to decide this except by trial in each individual case. He had given 150 exposures to one patient without any ill-effect. Another patient, who had been in bed for seven years with paralysis agitans, was successfully treated after 30 exposures for epithelioma of the face. A patient with lupus after 200 exposures showed a gain in weight. In another patient a small epithelioma of the ala of the nose, after eight or ten exposures, and without any cutaneous burn, was entirely cured. But inside of a year this patient developed a facial paralysis and general ophthalmoplegia with paralysis of the branches of the fifth nerve and with marked trismus. The *x*-ray experts to whom he had related this case regarded it as simply a coincidence and as being due to an old otitis media, from which the patient suffered.

DR. J. C. PRICE, Scranton, Pa., said that absolute precision is necessary in these matters. In his own experience he had exposed a number of patients with nephritis and with no untoward results. The urine had been watched and studied most carefully. In one case, that of a patient with a chronic interstitial nephritis, there was a wonderful improvement. In another case of a woman with a large carcinoma of the breast, there were exposures for eight months and an apparent recovery followed. At the time of beginning the exposures the urine was loaded with albumin and there were a great many casts, as well as many of the waste products in the urine. A gradual improvement followed the use of the *x*-ray, and after its discontinuance she lived four or five years. He said he would like to know the results of the *x*-ray in leukemia.

DR. D. L. EDSALL, Philadelphia, said that he did not at all mean to indicate that he considered that persons with certain diseases are to be denied the use of the *x*-ray absolutely. He merely meant that cases of nephritis, as well as those with other diseases, should never have the *x*-ray used unless it seems distinctly important that it should be used. If there are indications for its use and, at the same time, contraindications, careful consideration should be given to the patient's condition; and the question should be decided, in accordance with the individual case, whether the advantages of using the *x*-ray are greater than the possible disadvantages. His objection had been raised chiefly against the common attitude of the profession, in which, until very recently, there has been little consideration given to the danger of the *x*-ray producing serious damage besides the possible burns that have long been recognized. Recently it has been clearly shown that dangerous general reactions may occur; but in spite of this, only a few days before, for example, at a meeting of prominent medical men, Dr. Edsall had heard several persons speak in a very easy manner of exposing patients to the *x*-ray daily for various purposes, such as locating the exact position and the progress of foreign bodies in the intestine, when very little was to be accomplished by such repeated exposures except to satisfy diagnostic curiosity. The *x*-ray should be used guardedly, and always with the feeling that one is using a very powerful agent; and one should know as exactly as possible the condition of the patient before resorting to its use. If contraindications are present, avoid its use entirely, if possible; but if it seems important to use it, do it very guardedly.

THE EFFECTS OF PERICARDITIS ON THE HEART.*

N. S. DAVIS, M.D.

CHICAGO.

The few minutes allotted to me make it impossible to do more than point out the most important effects of pericarditis on the heart and their significance. This subject, however, is not unimportant, for the lesions of pericarditis are, much oftener than they should be, undetected by practitioners. Chronic pericarditis or pericardial adhesions rarely can be detected; fibrinous pericarditis should be in a large majority of cases, but I am sure is not, and pericarditis with liquid effusion ought to be recognized always. These lesions are overlooked especially because they are secondary in almost all cases to an infection which produces other symptoms that are the most striking and hold the attention of the patient and physician.

Whenever the visceral pericardium is inflamed deeply, the muscle beneath is involved also. However, it is rare that the myocardium is greatly weakened by an acute pericarditis. Moreover, pericarditis is usually not general and, therefore, comparatively few muscle fibers are

* Read in the Section on Practice of Medicine of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

injured. A quickened and sometimes irregular pulse is caused by irritation both of the pericardium and myocardium due to such inflammation.

Pain or oftener discomfort or distress in the region of the heart is a common symptom of pericarditis and is due to the constant rubbing of a denuded surface with each throb of the heart. Tenderness is more frequently observable than pain and is greatest when the costal pericardium is inflamed, although not always wanting, when the visceral surface is the seat of inflammation.

A friction fremitus is felt and friction sounds are heard both when a rough abraded pericardium is rubbed by the moving heart and when under the same circumstances the pericardial surfaces are pulled asunder or loosened from one another, though imperfectly glued by a fibrinous or tenacious sero-fibrinous exudate of small amount. It is important to remember that friction sounds are rarely transmitted far and are, therefore, usually heard only over the heart or a portion of it. This fact is an aid to diagnosis and in sharp contrast to the usual distribution of endocardial murmurs. Most frequently they are heard at the base of the heart. Deep inspiration which often makes a pleural rub plainer usually lessens pericardial friction sounds. However, there are numerous exceptions to this general rule. I need not describe to this audience the character or differences of these sounds and endocardial murmurs.

In a large number of cases of pericarditis, resolution occurs when the inflammation is fibrinous and the pericardium is restored rapidly to a condition of health or only slight and harmless adhesions or trivial thickening of a surface is left as a mark of the disease.

When a thick fibrinous exudate is formed and especially when a considerable serous one is, the heart sounds are distant and weaker than is normal, but friction sounds and fremitus are wanting. The apex beat also is usually undiscoverable. If the exudate is a thick fibrinous one, the area of precordial dullness will be increased, but will not change its shape or position materially when the patient changes his position. But this is not true when there is a considerable liquid effusion, for then the shape and size of the large area of precordial dullness will change as the patient shifts his position. It will be relatively small and will approach normal shape if the patient lies on his back, but if the patient sits erect will assume its characteristic triangular shape with the apex of the triangle at the base of the heart. The liver also is usually displaced downward more or less because of the weight of the distended pericardium. In this position the apex beat of the heart may be seen or often vaguely felt, but not at the extreme left and lower angle of the area of dullness. Moreover, the apex beat will shift somewhat from side to side as the patient leans from right to left, for, with the swaying of the patient's body, the heart is capable of some to and fro motion in the distended pericardial sack.

Even more striking than these effects of pericarditis with effusion are dyspnea, cyanosis, an anxious countenance small, feeble or irregular pulse and distended cervical veins. These symptoms are most marked when the effusion is rapidly developed or is very great. The cause of them is easy to comprehend. Dyspnea and cyanosis are partly due to compression of the lungs by the enlarged pericardium, but much more to the defective action of the heart which its compression causes; neither of the cavities of this organ can expand fully and they can not contain a normal quantity of blood. Necessarily, therefore, the blood will be propelled with diminished force. Moreover, the auricles and venæ cavæ which are soft and easily compressed are so squeezed as to produce the passive congestion commonly noticed in the distended veins of the neck and sometimes in a distended and pulsating liver. Although the pericardium when enlarged presses on the bronchi, they are rarely compressed enough to cause dyspnea because of their rigid walls. But the weight of the pericardium impedes the diaphragm in its movements and is another factor provocative of dyspnea.

A distended pericardium is said sometimes to compress the esophagus so as to make swallowing uncomfortable. Very rarely, too, pressure on the recurrent laryngeals paralyzes the vocal cords. That these effects are very infrequently observed is, I am sure, true because I have not observed them, although I have seen many cases in which the pericardium was very greatly enlarged by effusions.

When the pericardium is filled with fluid, not only is the area of precordial dullness increased in front, but one may be made in the lower part of the interscapular space on the left side, and at the same place tubular breathing can be heard. These latter changes are due to compression of the lung.

The *x*-ray is a help in detecting pericardial effusions. The shadow viewed from in front cast by them is more globular than the normal heart and the left border does not pulsate as the normal heart does. Viewed from the side, the triangle between the heart, the vertebral column and the diaphragm, which normally is a bright space, is obliterated by the shadow of the exudate which fills it. Fluctuation in shape and in position of the shadow cast by the enlarged pericardium is also readily seen when the patient changes his position.

The diagnosis of fibrinous pericarditis is often difficult, for friction sounds are not constantly produced; indeed, the commonest symptom is tenderness, and occasionally a diagnosis is justified when there is a good cause for pericarditis and the intercostal spaces over the heart are distinctly tender.

In a small majority of cases in my experience, however, no symptoms can be found to suggest the trouble.

Only when pericarditis complicates a disease which already has caused great enfeeblement, such as a cachexia Bright's disease or endocarditis, does the myocardial derangement produced by a fibrinous inflammation endanger life. It may then cause very rapid or irregular pulsation and often progressively feebler beating until the heart stops, exhausted.

On the other hand, if there is much serous effusion, a diagnosis is not difficult. The effects of effusion on the heart make plain the basis of a diagnosis. When an effusion is small or very moderate, the increased area of dullness is often wrongly ascribed to cardiac dilatation. This diagnosis seems more plausible because of the rapidity and feebleness of the heart sounds and feebleness or absence of the apex beat. The shape of the area of dullness and the partial or total obliteration of the normal right angle or comparatively sharp one between the right border of cardiac dullness and upper border of liver dullness which an effusion causes should help greatly to a correct diagnosis. However, as most patients who suffer from pericarditis are examined in a recumbent posture, these physical changes are not very evident. Under these circumstances, also, precordial tenderness is always a great aid to a diagnosis.

In children and in adults when the chest wall is thin the edge of the heart can be felt through the intercostal

spaces and especially when it is dilated and hypertrophied. If a finger is drawn along an intercostal space from the axilla to the sternum and at the same time pressure is made from point to point along this course, it meets with marked resistance at the edge of and over the heart, but when the pericardium is filled with fluid less resistance is felt and sometimes even a sense of elastic resistance is experienced.

Mediastinal tumors are another source of error, for they also often cause enfeeblement or disappearance of the apex beat and an extensive area of dullness in the center of the chest. However, its shape is less regular and not that which I have described as characteristic of pericardial effusion. Moreover, it must not be forgotten that mediastinal tumors sometimes produce a pericardial effusion and then a commingling of symptoms of both will be found, which will make a diagnosis difficult and sometimes a complete one impossible. I have in mind two such cases, in only one of which was a complete diagnosis possible. In the other the heart was encapsuled by a mediastinal tumor and in the pericardial cavity the heart was compressed by an effusion which could not distend the thick rigid capsule about it.

Of the conditions which make difficult the recognition of a pericardial effusion, encysted pleurisies are always mentioned. It is easy to imagine the various symptoms which they might cause, but in my experience they are rarely located where they can be confounded with a pericardial effusion. I do not recall a single instance.

I need not say that the character of the fluid in the pericardium can be determined only by aspirating some of it. While with rare exceptions it is serous, it may be bloody or purulent.

There are another series of effects of pericardial inflammation on the heart which I have not yet mentioned. I refer to the effects of adhesions between the pericardial surfaces. Usually these are slight and about the base of the heart. They rarely interfere with the function of the heart to a serious or even noticeable extent. However, when they are developed in those who are cachectic or enfeebled by some chronic disease, they may cause the usual symptoms of asystole; symptoms which, as a rule, are slowly developed. But no symptoms characteristic of pericardial adhesions are produced.

When adhesions are extensive over the anterior surface of the heart involving the apex or its neighborhood as well as the base, and when the pericardial inflammation which produced them has also caused unusually firm fixation of the costal pericardium to the sternum and adjacent ribs, modifications of the phenomena produced by the heart will be caused which make a diagnosis possible. These phenomena are (1) systolic retraction of the apex and intercostal spaces over the heart and often of the lower end of the sternum and epigastrium; (2) diastolic projection of the chest; (3) diastolic collapse of the cervical veins, and (4) a fixed, unchanging area of cardiac dullness in every phase of respiration.

The first of these symptoms is due to the transverse contraction of the ventricles of the heart. This would be better understood if we were to make a diagram in which the heart is represented as fastened firmly to the chest by its anterior surface and to the diaphragm below, often to the spine behind. If now the transverse diameter is lessened, the precordia must be drawn in, and if the diaphragm is adherent to the heart it will be pulled up and will help to draw in the epigastrium. The lifting apex beat normally is caused by the attempted straightening of the arch of the aorta when the blood is forced into it, and lengthening of the ventricles when their transverse diameter is lessened during systole. But when the pericardium and heart are fastened firmly to the wall of the thorax, straightening of the aorta is impossible and lengthening of the ventricles causes the apex to descend against the diaphragm not to make an outward thrust against the chest wall.

It must be remembered, however, that similar, though usually less pronounced systolic retraction is sometimes caused by adhesions only at the base of the heart, and by atheroma of the aorta and stenosis of the aortic valves.

A diastolic projection of the chest is due to its assuming its normal position after retraction and to the simultaneous distension of the ventricles with blood.

The diastolic collapse of the cervical veins is doubtless due to these same causes, for the sudden production of negative intrathoracic pressure on the great veins in the chest when the thorax expands during diastole and simultaneous emptying of the auricles causes a rapid emptying of the large veins near the heart during diastole.

Of all these symptoms the most trustworthy is the unchanging shape of the area of precordial dullness during inspiration and expiration. That this condition must exist seems self-evident when a pericarditis and an extra pericarditis fasten the anterior surface of the heart to the wall of the chest, for then it is impossible for the left lung to overlap the heart to an appreciable extent.

But cardiac synechia, partial or extensive, is rarely recognized during life, for the conditions which will produce the symptoms just enumerated are not common.

Asystole may be expected to develop sooner or later when there are extensive pericardial adhesions, but if they are formed in early adult life and the heart is not soon after their formation overtaxed, compensation will be affected by cardiac hypertrophy and functional adequacy may be perfect for many years. At autopsy I have seen numerous examples of this. Therefore, except in those who are enfeebled by a chronic disease, or in those who are young and who will tax their heart to keep pace with growth, pericardial adhesions are not very dangerous to life. However, even if the adhesions are well compensated for a severe acute illness may break this compensation and precipitate a condition of asystole. Moreover, when pericardial adhesions complicate chronic valvular disease of the heart, as they often do, both the peri and the endocardial disease arising from the same infection and usually from rheumatism, the adhesions will help to increase dilatation and hypertrophy and to hasten asystole. Under these circumstances a lesion, which from the extent of the involvement of the valve might not be grave, becomes so.

Pericarditis is not generally a fatal lesion. It is variously estimated that from 50 to 75 per cent. of all cases recover. Rheumatic pericarditis, as compared to that caused by other infections, is benign. Hemorrhagic and purulent pericarditis is almost uniformly fatal; always so unless recognized and successfully treated.

About one-third of all cases of pericarditis are serofibrinous; about one-sixth are hemorrhagic or purulent; one-twelfth tubercular; in approximately the same number there is total synechia, but in one-third there are adhesions between part of the pericardial surfaces.

A rapidly developed effusion is dangerous, but recovery can be effected or life prolonged even in a majority of these cases by aspiration and treatment.

A large, slowly-developed effusion is not as threatening or immediately dangerous, and a small effusion is of no greater gravity than fibrinous inflammation.

A prognosis must be influenced largely by the condition of the muscle of the heart at the time of the pericarditis. Chronic alcoholism and the cachexias of cancer, Bright's disease, and tuberculosis, make slight the possibility of prolonging life. Pericarditis in these cachexias is usually due to a terminal infection and is often the immediate cause of death. It is also a much more serious complication of pneumonia than of pulmonary tuberculosis and a very grave complication of sepsis.

As might be expected, it is most dangerous in the earliest and latest years of life.

ANGINA PECTORIS—TRUE AND FALSE.*

JAMES M. ANDERS, M.D., LL.D.
Professor of Medicine and Clinical Medicine in the Medico-Chirurgical College.
PHILADELPHIA.

True angina pectoris is, comparatively speaking, an uncommon condition. The mechanism involved in its pathogenesis is imperfectly understood, and the views found recorded on the subject in medical literature are, for the most part, hypothetical. Two facts, however, are generally accepted: First, that structural changes of the cardio-vascular system are present in the immense majority of cases, the chief among them being arterial sclerosis, especially of the coronaries, aortic regurgitation, aortitis (syphilitic?), hypertrophy, aortic aneurism, adherent pericardium and myocardial degeneration—fatty and fibroid. These lesions may be variously combined and the instances in which a certain grade of calcification of the coronary arteries and root of the aorta, associated with more or less myocardial degeneration, has not been found in evidence postmortem, are of rare occurrence.

The second fact which passes current is that irritation or disturbance of the cardiac sensory nerves exists. Unfortunately most of the leading theories concerning the nature of angina attempt to explain the cause and seat of the pain, their authors forgetting that this symptom is but one of a group of characteristic features. While, therefore, a universally acceptable theory of the pathogenesis of this syndrome lies before us in the future, yet if the few isolated facts, which appear to be amply attested either by clinical experience or postmortem observations, were to be brought into harmonious union, our conception of the symptom-group under discussion would doubtless become less vague and indefinite than it has been hitherto.

ETIOLOGY.

Multiple views are held regarding the question of the immediate cause or causes of the precordial paroxysms and to refer briefly to the more important ones will serve my purpose. In the first place, the theory that angina vera is a neuralgia either functional or of neuritic origin, is untenable, since it neither accounts for the mental anguish and other associated phenomena (as pointed out by Osler) nor for the cases of *angina sine dolore*.

The somewhat analogous clinical phenomena presented by intermittent claudication, in which the principal pathologic condition is also arteriosclerosis, are believed by some writers to throw a welcome side light on the mode of origination of angina in some cases at least. Neurologists and clinicians concur in the opinion that the pathogenesis of intermittent claudication embraces two leading factors, namely, arteriosclerosis and angiospasm of the affected blood vessels, suddenly induced by the usual exciting factors. Typical cases, which later developed angina pectoris with fatal termination, have been reported by Charcot and others.

In speaking of the relation of angina pectoris to arteriosclerosis, Osler remarks, "the pain in angina pectoris is *sui generis*, unlike in intesity any known variety, and while its association with the coronary artery sclerosis is unquestionable, there is something additional, some other element for which, as yet, we have no explanation."[1]

There are not a few eminent observers who seriously question whether the vasomotor spasm affecting the blood vessels in angina pectoris stands in the relation of a causative factor. Says Allbutt,[2] "Are not secondary vasomotor events translated from cause to effect?" A Morrison[3] from an interesting series of sphygmograms infers that constriction of the peripheral vessels either during the course of or after an attack of angina is often the result of the attack, rather than the cause. Hill and Barnard[2] seem to have shown that intracardiac diastolic pressure is constant during large changes brought about in other pressure areas by vasomotor constriction. To effect a more or less complete relaxation of the vasoconstriction in any case in which it accompanies the seizure, however, serves to ameliorate the attack.

It must be recollected also that the leading exciting causes of angina pectoris—muscular exertion, mental emotion, gastrectasis, exposure to cold—all quickly raise the arterial tension. The occurrence of associated vasomotor spasm is true of most forms belonging to either true or false angina. The theory of intermittent claudication originally advanced by Allen Burns still finds a place in the realm of speculation, since it is impossible to conceive of coronary ischemia in connection with an unimpaired rhythm of the heart as is witnessed in many cases of angina.

The seat of the pain is undoubtedly in the heart in angina pectoris and the paroxysm itself is the result of an extra stress or strain thrown on an organ that fails to respond to a normal environment, or to the usual external stimuli. MacKenzie[4] holds that since angina pectoris arises in connection with a great variety of gross morbid lesions of the heart, there must be an exciting cause common to all cases, and this he believes to be impairment of the muscular contractility of the heart.

As *a priori* evidence, MacKenzie cites the fact that this is the function "directly concerned in furnishing the motive force to the circulation of the blood and that it is the function that will necessarily become exhausted when an excessive resistance is opposed to the contraction of the heart muscle. The opposed arterial pressure may be abnormally high, but as a rule greatly lowered, since angina vera is a late complication, or to speak more accurately, a terminal condition. In either cases the extra stress or strain imposed by the action of one or other of the existing causes will exceed the contractile power of the heart and as a consequence suddenly induce an attack."

---

* Read in the Section on Practice of Medicine of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

1. THE JOURNAL A. M. A., Sept. 17, 1904, page 775.
2. Lancet, July 18, 1903.
3. Lancet, Nov. 1, 1902.
4. "An Inquiry into the Cause of Angina Pectoris." J. MacKenzie, British Medical Journal, Oct. 7, 1905, p. 845.

This theory readily explains the cases of angina that occasionally follow an attack of pneumonia or other severe infection in advanced life in subjects of coronary disease with myocardial degeneration. I have recently seen a case in point (as a sequel of pneumonia) with Dr. Jungman, of Philadelphia. The theory of MacKenzie also elucidates a number of cases, which have been shown by observations carefully analyzed, to be independent of any coronary involvement as well as those of *angina sine dolore.*

A leading view ascribes the attack to a cramp-like contraction of the myocardium and although such a state of things might be excited by coronary infarctions, it would, as previously stated, preclude the possibility of regular and orderly rhythm of the systole.

A. Morrison[3] holds that the paroxysms are due to "the distinctive throb of the blood cast by the dilated yet powerful ventricle into the aorta and coronary system;" also that the condition may be due to the effects of neuritis, to muscular spasm and to hemic conditions, the blood exercising pressure on local diseased areas. Colbeck[5] contends that the cause of the paroxysm is a localized distension and stretching of the diseased areas in the ventricular wall, and Traube has advanced much the same opinion.

It is a common observation that stimulation of the heart in which predisposing conditions exist, more especially by the use of digitalis, which induces more energetic contraction and raises the peripheral tension, may provoke a recurrence or at all events, aggravate existing stenocardial pains. On the contrary, it is an equally familiar fact that the exhibition of arterial relaxants, e. g., nitroglycerin, is often followed by decided relief. Such considerations as the foregoing, however, do not explain why angina is admittedly uncommon among the working classes or hospital patients who present cardiac lesions identical with those met among the better-to-do in whom the syndrome is of far greater frequency of occurrence.

TRUE ANGINA.

Angina vera occurs principally in men engaged in sedentary and, for the most part literary pursuits, as well as those who follow an inordinately strenuous business career; in short, persons whose nervous mechanism is minus as the result of overwork, principally mental, with insufficient rest. An impaired nervous vitality, therefore, is to be looked on as a marked predisposing element. Is not the fact that angina is a neurosis of the heart too constantly overlooked?

This condition of the nervous system may be looked on as being neither less nor more than neurasthenia, but may there not be added some peculiar, nutritional or degenerative change in the nervous system, brought about by high nerve pressure, which finds its expression in a peculiar neurosis that serves as the predisposing element in angina pectoris?

No theory of the genesis of this syndrome is complete that does not account for *angina sine dolore,* in which the main feature is an indescribable almost painless, sensation or precordial oppression. The true essence of the condition may yet be discovered in connection with this minor group of cases. The history of an illustrative case may be briefly narrated, more particularly because of its intrinsic interest and anomalous character.

5. Lancet, March 21, 1903.

History.—M. D., female, married, aged 59 years; height, 5 ft., 2 in., weight 153 lbs. Two paternal uncles died suddenly of "heart failure," after the seventieth year of life, and one brother died at 54 of organic heart disease. The patient had had numerous recurrent attacks of follicular tonsillitis up to four years ago, and rheumatic pains at intervals, more particularly in the shoulders.

The social history embraces nothing worthy of mention save only that the menopause had been passed five years previously. The principal complaint at my first visit was constipation, which dated from the time of change of life. There was, however, slight dyspnea on exertion.

Physical examination revealed a moderate degree of emphysema and mitral incompetency in the stage of compensation.

Treatment.—The treatment during the next four years consisted of a rearrangement of the diet and an occasional laxative pill and a small daily amount of Celestine vichy.

Course.—Oct. 5, 1905, the patient complained of slight pains in both shoulders and the upper half of the precordial region with radiation to the left arm, which was also the seat of numbness. While the pains were never severe, they behaved like those of true angina, being excited by walking, facing the cold winds and mental excitement. Associated with the precordial pains was a sensation of marked cardiac oppression, and there was a moderate degree of anguish detectable. The seizures became recurrent first at intervals of a few days, and towards the close of life of about six hours. With the advance of the case the thoracic oppression was attended with a feeling of smothering or suffocation, and dyspnea also entered into the syndrome. The principal seat of pain, which was at no time severe, shifted later to the epigastrium for a time, to be followed in the course of a couple of weeks by *angina sine dolore,* the starting point of the seizures being in the epigastrium. A well marked restlessness and an almost uncontrollable desire on the part of the patient to leave her bed was present during the last few days of life. A striking feature was the manner in which the oppression recurred during a period of two or three weeks prior to death; it invariably originated in the epigastrium and right hypochondriac region, then traveled wave-like upward over the thorax, becoming most marked in the lower sternal region, and attended with dyspnea and suffocative sensations as already remarked. Neither in the epigastrium nor thorax (the heart apart) could be found evidences of disease to account for these symptoms. Objectively, the usual signs of angina pectoris were noted, especially the anxious facies and the ashy-gray appearance of the countenance.

Finally death came quickly on Jan. 15, 1906, after a pleasant chat with the nurse, without manifesting any distressing symptoms that were observed. There was neither arrhythmia nor evidence of arteriosclerosis present.

This particular form is found engrafted on a variety of structural cardiac diseases and may, therefore, be looked on as a terminal condition. I had never previously observed a case belonging to this category arise in the course of simple mitral incompetency, but one instance in the course of mitral stenosis. G. Steele[6] has reported two cases of angina pectoris occurring in patients with mitral stenosis and he believes that symptoms so similar to angina occur in this disease that there is no reason for giving them another name.

Angina sine dolore is not uncommon, as pointed out by Oliver,[7] in dilatation of the heart, aneurism of the first portion of the arch and adherent pericardium. What exactly is the essential cause of the absence of intense pains in these cases is still an unsettled question. It has been held to be on account of ensuing dilatation as was true of cases reported by Musser,[8] but

6. Lancet, Nov. 23, 1903.

7. "Angina Pectoris and Allied Conditions," Lancet, Sept. 16, 1905.

8. American Journal of the Medical Sciences, vol. cxiv, 1897, pp. 294-302.

apart from a slight increase in weakness of the systole toward the close of life, no change in the physical signs were noted in my case reported above. From the fact, however, that the use of moderate sized doses of digitalis (given as a test) aggravated the precordial pains in the earlier stages of my case, the view that increased endocardial pressure stands casually related to this symptom receives a considerable degree of coloring.

This class of cases reminds us forcibly that a distinction is to be made between intense paroxysmal precordial pains and angina pectoris; that the essence of the essential difference between so-called false and true angina is to be found in some as yet unknown agency or possibly in the different degrees of impairment of the muscular contractility in the two conditions, this being slight in the former while it is carried to a dangerous extent in the latter, principally because of the associated structural lesions.

The claim has been made by some writers that cases in which the pain originates below the diaphragm are less threatening to life, but in this opinion I do not concur. Finally, true angina pectoris may be dependent on a diet containing an excess of proteids. The toxins in the circulating blood in chronic intestinal toxemia or autointoxication may primarily cause the toxic form of false angina; this occurs ofttimes in the young at a period of life when the balance of power is with the organism and gross structural changes do not arise, but at a later period the balance of forces is with the circulating toxins and slowly progressive degenerative changes of the cardiovascular system are the result.

Obese persons who exhibit high arterial tension with arteriosclerosis and left ventricle hypertrophy may, as I have observed, develop angina pectoris as the result of a rearrangement of the dietary, so that proteids in liberal amounts are allowed and the carbohydrates greatly restricted, with a view of overcoming the corpulency. In this class of cases, there is a strong probability of effecting a cure by appropriate measures, which consist principally in rest, arterial relaxants, stimulation of the emunctories, and a return to a mixed dietary.

PSEUDOANGINA.

In 1812, Latham described false angina. The term "false" or "pseudoangina" is applied to a large group of cases in which the predominating feature is precordial pain, sometimes with radiation. This term has been objected to by many eminent authorities, but inasmuch as the condition is allied symptomatically to true angina, rendering a differential diagnosis well-nigh impossible in many instances, I favor the use of the term pseudoangina until additional light shall have been thrown on the whole subject.

At the outset, I insist that many of the slightly painful conditions affecting the precordial region in rheumatic, neurotic and hysterical subjects can not be properly regarded as falling under the head of pseudoangina.

Doubtless, the majority of cases originate in vasomotor instability and irritability, and as would be expected, they are met with in the female, more especially the hysteric type, and about the period of the menopause. Heartstrain occasioned by suddenly-induced vasoconstriction will result in pseudoangina (Nothnagel) characterized by a special set of symptoms—palpitation, a feeling of faintness, precordial pain, perspiration with coldness of the extremities and lividity. Again, the instances of angina directly traceable to autointoxication from errors of diet should be placed in the same category provided that no sub-basis in the nature of an organic lesion of the cardiovascular system is discernible. As previously stated, this variety of angina pectoris may be induced by an excess of proteids in the dietary. The recognition of the special cause and its removal if carried out sufficiently early in the course of the affection will, as a rule, lead to an absolute cure.

It will be seen that true angina and pseudoangina have causative factors and symptoms (as pains and vasomotor disturbance) in common. Spurious angina, however, differs from the true form in three leading particulars—first, gross organic lesions are absent; secondly, it differs symptomatically, and thirdly, it usually yields to appropriate treatment.

The cases of pseudoangina are divisible into three groups, namely, the neurotic, the toxic (two groups suggested by Osler) and reflex pseudoangina. The last-named clinical or etiologic type is rare in the experience of some writers and is usually classified as a subvariety of the neurotic class of cases. In my opinion, these instances are of sufficient importance to demand separate grouping. I do not include here the gastrointestinal phenomena that are found associated with true angina, but those that induce paroxysmal and intense breast-pang in subjects who present no gross cardiovascular lesions.

The fact that certain contributing factors in true angina are present in this variety is of great practical importance and explains why, apparently, typical cases of the spurious form, after the development of some gross cardiac lesion, may merge into true angina.

Cases in which apparent transition from false to true angina occurred, have been reported by Duffield,[9] Allbutt,[10] Morel-Lavallee[11] and others. I have seen two examples; the first occurred in a neurasthenic female who, while under observation for pseudoangina, developed arteriosclerosis, including coronary disease. The intensity of the pains remained uninfluenced, but mental anguish and dyspnea of a pronounced character became superadded features. A fatal attack occurred in the course of five years after the first true attack.

I may be permitted to refer to a second instance which recently fell under my notice.

A woman, aged about 40 years, who was distinctly hysterical, developed well-characterized attacks of pseudoangina at long intervals. A couple of years later indefinite signs of arteriosclerosis about the base of the heart developed, after which the symptom-complex simulated more and more closely true angina pectoris, and finally became typical of the latter condition. When I last saw the patient a slight mitral incompetency was present; this had obviously diminished the severity of the anginal seizures. I have been unable to learn the condition of the patient, who resides at the south, during the last four months.

From personal studies and experience I feel privileged to speak confidently regarding certain cases, which so far as can be determined by known methods of examination at least are non-coronary, but sometimes prove to be fraught with lurking dangers. In many cases of true angina pain alone is experienced (Osler) and this is more especially true of the milder forms. I recall a fatal case of *angina vera*, which I saw with Dr. Shivers, of Haddonfield, New Jersey, in which mental anguish and cardiac oppression were absent and during the par-

9. The Pathology of Angina Pectoris, Proceedings of Mich. State Med. Society, 1901.
10. Philadelphia Med. Jour., June 16-30, 1900.
11. Revue de Médicine, Paris, Nov. 10, 1890.

oxysms the patient exhibited great restlessness and commotion, such as commonly occurs in the false variety.

DIFFERENTIAL DIAGNOSIS.

When angina pectoris is well characterized we can differentiate it in a decisive way from the false variety by the *angor animi* and the strong sense of imminent dissolution. Many additional symptoms may be associated during the paroxysms, but are not necessarily present and only serve to corroborate the diagnosis of true agina. Among these, I would mention more particularly, respiratory disturbances, including asthma, dyspeptic symptoms and vasomotor disturbances, such as pallor of the face (rarely lividity), sweats and coldness of the surface. On the other hand, pseudoangina of pure form is often associated with the menstrual function and its effect on the vasomotor nervous system. The rôle played by hysteria is also conspicuous as shown by the presence in some cases of globus during the attack. Unlike in true angina we note marked throbbing of the cervical vessels and epigastrium as well as flushing of the countenance during the seizures. There may be a clear history of toxic poisoning (tobacco) or reflex visceral irritation to support the diagnosis of pseudoangina. The paroxysms are not provoked by muscular exertion, mental emotion or worry and feeling cold winds as in real angina, but arise spontaneously as a rule.

It may be argued with considerable force that since real angina pectoris may occur in hysterical and neurasthenic subjects with or without gross cardiac lesions, there must be a contingent of cases in which a diagnosis within the limits of a reasonable probability only is possible.

It is the clinically mild and doubtful cases that come more particularly within the scope of the present discussion, and since it has yet to be shown that these are incapable of developing into typical angina vera, a most exhaustive survey of examples of the sort must be carried out before pronouncing in favor of false angina. It is permissible only as a rule to determine the inherent probabilities of a given case and opinions must be offered with due caution and reserve. It would also be far more helpful to patients suffering from dubious cases if they were treated for true angina until the question of diagnosis were definitely settled.

RELATION OF PSEUDOANGINA TO ANGINA VERA.

The relation of so-called pseudoangina to true angina pectoris is not definitely known at date of writing. The nascent stage of true angina, which may not be well characterized, is sometimes mistaken for the false form.

It is admitted that cases of angina vera ending fatally may fail to show any cardiovascular lesions. In such instances, the severity of the precordial pains during the paroxysms may cause the arterial pressure to fall so low as to be followed by fatal syncope. On the other hand, death from pseudoangina is unknown.

It can be accepted as a fact that the chronic lesions met with in angina pectoris may be excited or initiated by the toxic and other causes of pseudoangina. Admittedly, transition from functional to organic disease of the stomach occurs, e. g., many cases of chronic gastric catarrh result from pure gastric neuroses. Another illustration is furnished by the toxic effects of tobacco, which ordinarily produce pseudoangina, although rarely the paroxysms finally simulate those of the organic form so closely as to be indistinguishable. Whilst the evidence, chiefly clinical, to establish this remote relationship of the two forms of angina, would appear to be clear and convincing, it must be granted that the results of improved methods of investigation more particularly as related to the arterial pressure, may in future enable us to interpret correctly all of the phenomena that enter into their clinical history and thus permit of an essential distinction between them or even to show that each is produced by a special cause.

Although there are apparently etiologic affinities between the two forms of angina—real and unreal—my view accords with that of Huchard, Osler and others, who claim that we should adopt this provisional classification and separate the functional from the organic form, whenever practicable.

Finally, it is commonly held, as before stated, that the false variety is solely of vasomotor origin, a sort of unsteadiness, which has been designated by S. S. Cohen[12] as vasomotor ataxia. True angina is allied to the functional form so far as vasomotor disturbances are concerned; it, however, embraces a variety of pathologic lesions whose relations to the symptomatic indications of the syndrome are truly obscure and complicated.

DISCUSSION

ON PAPERS BY DRS. ERLANGER, THAYER, POTTER, DAVIS AND ANDERS.*

DR. EDMOND GROS, Paris, France, referred to the three instruments which are variously used in different countries for the measurement of blood pressure, viz.: the Potain or modified von Basch, the Gærtner and the Riva Rocci. In France the Potain Sphygmomanometer is used almost exclusively. He was interested to know how this compared with the Gærtner and Riva Rocci measurements and was struck by the difference of pressure obtained with these instruments. The reason for these variations no doubt lies in the fact that each instrument measures the blood pressure in a different manner and in a different region of the body. Furthermore, there is in each case a factor of error which does not seem to be avoidable. The Potain, when properly applied, seems to give a relatively accurate measurement of blood pressure, but the pressure will be found too high if the recurrent circulation be not carefully obliterated. The Gærtner ring is applied in a region so rich in capillary blood vessels that various vasomotor influences such as pain, emotion, fever, etc., cause rapid changes in blood pressure. In fact Tessier has found that the very fact of tightening or loosening the Gærtner ring on the finger in eruptive fevers, raises the pressure in the radial artery from 10 to 30 m.m., evidently acting in the manner of a slight trauma. Gros exhibited an instrument which, he explained, is an ingenious adaptation of the Gærtner ring to the sphygmomanometer devised by Bouloimié of Vittel. It greatly facilitates comparison of the presures obtained by these two methods. He has found that the blood pressure measured in the radial artery with the Potain ranges from 120 to 160 m.m.; the Gærtner indicates a pressure of from 10 to 30 m.m. lower, but the breech gradually widens when the radial pressure runs above 200 or 220 so that a pressure of 260 with the Potain corresponds to about 220 with the Gærtner.

The Riva Rocci, which represents the blood pressure in the whole of the arm, is relatively accurate, but here again the error factor comes into play, the tightening of the cuff first obstructing the venous circulation before obliterating the brachial artery. Therefore, the pressures obtained are higher than either with the Potain or the Gærtner.

Here, then, are three instruments in use in different countries giving markedly different measurements in each case, the figure not ever varying in any direct ratio. Until a standard of blood pressure is determined the figures found by different authors lose much of their value and can hardly bear comparison.

DR. WOODS HUTCHINSON, Redlands, Cal., thought that what stood out in the symposium as of prime importance, is, first

12. Transactions of the Association of American Physicians, 1902.

* The papers by Drs. Erlanger, Thayer and Potter appeared in THE JOURNAL, October 27.

of all, that too exclusive attention had been paid to the condition of the valves in heart disease. We have been too much inclined to regard them from purely a mechanical point of view, and to say that damage to the valvular mechanism was the most important thing. To-day most men go to the opposite extreme. Valvular lesions are relatively harmless so long as the endocardium is intact. The fact should be recognized that the heart is a pulsating mechanism with a sphincter valve action; not only do the valve flaps play a purely mechanical bucket-pump action in checking the regurgitation of the blood, but contraction of the ring of muscles surrounding the valvular orifice occurs and should be considered as well. There are a large number of murmurs, so-called valvular murmurs, which are due to disturbances of the musculature of the heart and not to the valve at all. He referred to one of his first cases, which went to postmortem, in which all the symptoms had pointed to a mitral insufficiency, and no lesions whatever of the valves were found, but the mitral orifice was extremely large, making the valve flaps inadequate to close it. The contraction of this sphincter auriculo-ventricular ring he considered a very important factor in carrying on the circulation. A heart with a perfect musculature can compensate very well even in cases of severe valvular lesions.

Secondly, too much attention should not be paid to the heart itself in cardiac troubles; serious damage of the heart may be compensated perfectly so long as the walls of the blood vessels and the general nutrition of the patient are in perfect trim. No better illustration can be given than to note how often patients with valvular mischief have outlived the men who condemned them to death. Valvular damage must be regarded, much as the gastroenterologists formerly did hyperchlorhydria, but so long as it does not cause the patient any discomfort it is of little consequence. He thinks somewhat the same position might be assumed as taken by an old German colleague on the alcohol question; he said that "alcohol injures no one except those with whom it happens to disagree." Even heart lesions may do little harm unless there is failure in compensation and lack of general recuperative power. With regard to the cause of heart mischief, by searching inquiry he was able to trace 70 per cent. of his cases to some acute infection, not so often to rheumatism as to the minor infections and exanthemata, tonsillitis, influenza, measles, typhoid, even summer diarrheas. If cardiac conditions were treated as sequelæ of infections and toxic conditions, better results would be obtained than by direct treatment of the heart itself. Indeed, the latter is often positively injurious instead of beneficial in the long run.

DR. FRANK JONES, Memphis, Tenn., discussing the paper read by Dr. Davis on "Pericarditis," said he had been struck in studying that disease by the analogy which could be drawn between diseases of the pericardium and diseases of the pleura; the same conditions may produce diseases of the pericardium that produce diseases of the pleura, such as rheumatism, pneumonia, tuberculosis, etc. He has been struck with the coincident pleural and pericardial affections, whether hemorrhagic, sero-fibrinous or purulent. Dr. Jones said that he has frequently observed cases in which the symptoms were held in abeyance, but the physical signs were marked. He has seen patients in the clinic with no dyspnea, no cough, no acceleration of the pulse and no temperature; but in whom physical examination revealed a pericardial sac two-thirds filled with liquid. In one case 16 ounces of pus were removed and this patient walked one-half mile. Dr. Jones believes that in the majority of instances of effusions of fluid in the pericardium the more insidious they are the more often will they be found to be tuberculous in nature. There are more cases of tuberculosis of the pericardium than is generally supposed.

In discussing Dr. Ander's paper on "True and False Angina Pectoris," he said that so far as he is concerned he has little patience with the nomenclature of false angina; there must be some pathologic condition back of it somewhere. In the production of pathologic conditions we hear of cardiac insufficiency, of hepatic insufficiency, of renal insufficiency, etc., but we do not hear enough of gastrointestinal insufficiency, frequently the *alma mater* of all insufficiencies. He said he was struck not long since in reading a paper on so-called pseudoangina pectoris, by the statement that if these cases were examined critically and the patients went on and lived a more vigorous life, the false would be run out and the true run in.

DR. W. S. THAYER, Baltimore, agreed with Dr. Jones' views as to the frequency of tuberculous pericarditis; he regards insidious sero-fibrinous pericarditis as being, in the majority of cases, tuberculous in nature; this is supported by the results of necropsies. He is inclined to regard the estimate that 12 per cent. of pericarditides are tuberculous as too low. With regard to angina, he agreed that in cases with anginoid symptoms it is sometimes difficult to determine whether or not grave organic cardiac lesions are present. The most important diagnostic sign is the effect of exercise; if the patient is suffering from true angina, the result of severe organic changes, exercise almost invariably brings it on. With regard to the seat of the pain, he has seen several instances in which the pain had been referred primarily to the back. In one case, now under observation, in which the pain follows any severe physical effort or mental excitement, it occurred first between the shoulders, later, accompanied by pain in the precordial region and numbness down the left arm. In discussing Dr. Potter's paper, Dr. Thayer referred to the interesting observations of Pässler and Heinecke, who have succeeded for the first time in producing cardiac hypertrophy in animals by removing first one kidney and later, in successive operations, portions of the remaining organ. After a certain amount of renal substance had been removed, polyuria followed without any increase in the blood pressure. On removing more kidney substance there followed a rise in the blood pressure which was permanent and associated with characteristic cardiac hypertrophy. They noted also that, in these animals, arterial spasm with further rise of blood pressure quickly followed stimuli which in normal animals would produce little effect. These observations would suggest that the heart hypertrophy is due to increased work dependent on the impediment to the circulation resulting from the tendency to arterial spasm due, in its turn, probably, to retained toxic substances.

DR. JAMES TYSON, Philadelphia, referred to two interesting cases of pleurisy with effusion and pericarditis with effusion. In the first, in a child of 8 years, the removal of a considerable amount of fluid was successfully accomplished by tapping in the seventh interspace midaxillary line and it was supposed to have come from the pleural cavity, but at autopsy the pleural cavity was found empty and it was found that the fluid came from the pericardial sac. The second case was one of supposed pericardial effusion. The fluid was successfully removed with a trocar introduced in the sixth interspace in the millary line, left side; and the vibratory motion conveyed to the distal end of the trocar made it reasonable to believe the instrument was in the pericardial sac. The fluid was also discharged in spurts, corresponding to the cardiac rhythm. Later there appeared signs of pleural effusion. At autopsy a typical tuberculous pericarditis was noted and in addition a tuberculous pleurisy with effusion. The autopsy did not afford evidence as to whether the fluid primarily removed came from the pericardial sac, but there was no reason apparent why it did not. These cases prove the possibility of the two conditions of pericardial and pleuritic effusion being confounded.

Dr. Tyson added that it has long been recognized that large hypertrophies of the various cavities of the heart, especially of the left ventricle, occur in chronic Bright's disease. He is inclined to think that the primary cause of this condition is a toxic condition of the blood, exciting resistance to its movement through the vessels, which in turn excites the primary cardiac hypertrophy. Arteriosclerosis caused by the same agency soon coöperates with this. This arteriosclerosis undoubtedly contributes to the hypertrophy of the left ventricle. Dr. Thayer's remarks as to the effect of experimental removal of portions of the kidney revives the theory of the resistance to the amount of blood passing through the blood vessels of the kidney caused by destruction of the organ and its replacement by fibrous tissue. In the matter of angina and pseudoangina Dr. Tyson said that he is disinclined to acknowledge pseudoangina as an entity; these cases ultimately prove to be either true angina or hysteria. Finally, he directed attention to the analogy between the pain in cramp of the muscles of the leg with the pain in angina

pectoris. Probably the muscular spasm in both is the result of anemia of the muscles and the cramp due to compression of nerves by the cramped muscles.

Dr. T. A. Claytor, Washington, considered only the blood pressure in heart conditions. In the first place he said that he has observed in cases of cardiac insufficiency, whether they be from valvular insufficiency or not, that when patients are first seen suffering from dyspnea, edema, and indications of loss of compensation, the blood pressure would be found to be high, even as high as 180 to 190. But after they had been kept in bed and given digitalis, the blood pressure fell. This is very remarkable, but he said he has seen it so often that he believes it to be almost the universal rule. When the blood pressure is high in loss of compensation, after the use of digitalis it falls and becomes almost normal.

He then spoke of a class of cases showing high blood pressure associated with cardiac hypertrophy with probably renal insufficiency. These patients, usually between 40 and 70 years old, give symptoms of slight shortness of breath on exercise and precordial distress. Physical examination reveals a hypertrophied heart, an accentuated second sound, and probably a slight mitral insufficiency murmur. Whether this is due to a real valvular lesion or due to the relative insufficiency it is hard to say. The blood pressure was found to be high. The urine showed the presence of albumin and casts at times. Such cases were probably Bright's disease. The blood pressure varied from 180 to 225 or more. The first idea that comes to all would be that the pressure is too high and should be reduced and the question arises what is the best means to reduce this high blood pressure. The ordinary nitrites are practically useless; nitroglycerin is of little value. Iodid of potassium has more effect. It relieves the headache which is often associated with high pressure and this is the most satisfactory means, aided by rest in bed, purgatives and a milk diet. Since high blood pressure is, in this class of cases, probably a conservative effort on the part of Nature to overcome a pathologic defect, Claytor doubts the advisability of making such strenuous efforts to reduce it in every instance.

Dr. C. M. Cooper, San Francisco, said that a young man recently entered the German Hospital in San Francisco in the service of Dr. Jellinik with symptoms of acute gonorrheal septicemia. He developed an acute Adams-Stokes syndrome. The disease ran an acute course and at postmortem an acute lesion was found in the vicinity of His' bundle, thus strongly emphasizing the relationship between a lesion of this bundle and the clinical symtom-complex known as Stokes-Adams disease. Recent work has shown the importance of taking simultaneous tracings of the venous and arterial pulse and of the heart beat in the study of all forms of heart disease. Hitherto, we have had to depend on the cumbersome cylinder drum or the finicky MacKenzie clinical polygraph. Jacquet has lately devised an instrument for this purpose, readily portable, well constructed, and clinically efficient. The practitioner will find it of much service. It must not be forgotten that the *x*-ray is of distinct service in the study of heart affections. Cooper has lately demonstrated at the San Francisco County Society plates showing distinct evidence of adherent pericardium; and of dilatation of the descending aorta behind the heart. The correlation of these plates with the symptoms and physical signs is of distinct aid in the diagnosis. He emphasized the infection theories advanced by Dr. Woods Hutchinson—probably often unrecognized or little-heeded sore throats, nasal catarrhs, alveolar pyorrheas, and urethral inflammations which by their summation of effect impair the cardiovascular system.

Dr. G. W. Norris, Philadelphia, said that during the past winter he has seen three cases of Stokes-Adams syndrome, one of which he had an opportunity of carefully studying. He has made tracings coincidently of the jugular and the radial pulses, as well as the cardiac apex beat. These tracings show very distinctly an extra number of auricular contractions. The auricular contractions were accelerated by deep inspiration, the ventricular rhythm was unaffected by this or by change of posture. He believes that by using the Jacquet polygraph we would be enabled to learn a good deal about cardiac diseases which has not previously been known, and that the tracings made by this instrument would prove not only of scientific interest but also of practical utility, especially in cases of arrhythmia; perhaps, also, in instances of pericardial adhesion; and possibly in differentiating between true and false angina pectoris. As a clinical procedure this method of studying heart affections is rather new, and probably some time will elapse before all the data thus obtained will be properly interpreted, but he thinks that a new field has been opened which holds forth considerable promise.

Dr. Bertram W. Sippy, Chicago, mentioned a sign brought out by Dr. Davis, viz., systolic retraction and adherent pericardium. This traction is caused by the outer pericardium being attached posteriorly; the remaining portion of the pericardium is also attached to the thorax; therefore, when the heart contracts, it pulls in on the surrounding structures, pulling in the intercostal spaces and so producing systolic retraction. This, he said, may, lead to an error in the diagnosis of adherent pericardium. When systolic retraction occurs at the apex, that, in connection with other physical signs, is sufficient for diagnosis. But systolic retraction occurring at the base of the heart occurs not infrequently without adherent pericardium. Systolic retraction he considers as an evidence of adherent pericardium only when it occurs at the apex and not at the base, and in connection with other physical signs. The great increase of the work of the heart caused by this condition practically always is associated with incompetency; it must pull on the surrounding tissues, thus handicapping it. Dyspnea, cyanosis, etc. will be present.

Dr. De Lancey Rochester, Buffalo, said he wished to speak of symptoms which he has observed in connection with pericarditis and to which Dr. Davis had not referred. First, there is pain in the interscapular region posteriorly between the shoulders, a symptom that he has found in many instances.

In reference to pseudoangina and true angina pectoris he agreed with Dr. Tyson that there is difficulty in distinguishing between them. Dr. Rochester then reported the case of a woman, between 45 and 50 years old, who was visiting in Buffalo and who was seized with pain in the epigastrium. He was called and found that she had been indulging in a promiscuous supper, that there was a considerable amount of pain and that this pain was the only symptom; there was no fear of death, no dyspnea, or other symptom. The pain was relieved after the stomach had been emptied. The next day she did not feel very comfortable; on the next day she again was seized with pain, not only in the epigastric region, but in the chest and left arm, and this pain had to be relieved with morphin. Dr. Stockton was called in consultation and they could not find any evidences of disease of the arteries. There was no nephritis and no evidence of arterial disease. The heart was of normal size and the sounds were good. The next night she was again seized with pain and died before he got there. The autopsy revealed a ruptured heart with pronounced arteriosclerosis, a thrombosis of the left coronary and a marked thinning of the muscle at the apex of the heart where the rupture had occurred. The rest of the heart muscle was in good condition. There was an arteriosclerosis of the coronary arteries.

Dr. Stephen S. Black, Pasadena, Cal., said that Dr. Sippy's remarks regarding the diagnosis of adherent pericardium by systolic retraction are very important, but that this is not the only thing which produces it. The apex beat is caused by a lengthening or straightening out of the aortic arch; also by rotation of the heart and, at the same time, by contraction of the ventricles. This all throws the heart against the chest wall. Any interference with the lengthening of the aortic arch, or contraction of ventricles, or rotation of the heart will cause a depression or retraction of the apex beat. He said he has seen very pronounced cases in which the apex was depressed during systole and there were no pericardial adhesions whatever.

Dr. Nathaniel B. Potter, New York City, quoted statistics from the City Hospital Autopsy Records, 1906, to show that nutrition has to do with cause of cardiac hypertrophy.

Dr. J. M. Anders, Philadelphia, remarked that Drs. Jones, Tyson and others objected to the term "pseudoangina," and he did not intend to defend this term. In the portion of his paper, which for lack of time could not be read, he had stated that, in view of the symptomatic relationship existing between true

angina and the false variety, rendering a differential diagnosis well nigh impossible in many instances, he would encourage the use of the term "pseudoangina" until additional light should be thrown on the whole subject. These cases of so-called pseudoangina might be regarded as hysterical in nature, as suggested by Dr. Tyson, but even severe precordial pain due to that cause must be separated from true angina for the sake of appropriate treatment. The case related by Dr. Rochester, which occurred in a neurasthenic person, later developed true angina and was similar to two cases reported in his own paper. His view, as previously stated, was that they hold fast to the provisional classification into pseudoangina and angina vera and separate the functional from the organic form whenever practicable.

OBSTRUCTION AT THE TERMINAL PORTION OF THE COMMON BILE DUCT

DUE TO CANCER OF THE AMPULLA. AN ANOMALY IN THE CYSTIC DUCT. SIMILAR OBSTRUCTION DUE TO PANCREATIC CANCER.

FREDERICK C. HERRICK, A.B., M.D.
CLEVELAND.

Cases of cancer at the terminal portion of the bile duct within the duodenal wall are sufficiently rare and the signs are sufficiently characteristic to warrant the following report.

Jaundice and pain are the most frequent signs of disease of the bile passages, jaundice belonging especially to common duct disease. Musser found it present in 17 of 18 cases of cancer of the ducts and pain in 12 of the 18. In gall-bladder disease jaundice is present in but 20 per cent. of the cases.

In 16 cases of cancer of the ampulla on record, jaundice has occurred in all, while pain is mentioned as present in but three, and then of an aching or general abdominal character.

This may be partly explained by the fact that when the ducts are the seat of cancer I found a history of gall-stones in but 18 per cent. of 25 cases, while various authors give from 69 per cent. to 95 per cent. of gall-bladder cancers as showing gall stones.

Occasionally the jaundice is due to a lesion, in itself of no consequence, but so placed as to obstruct some important function of the body as, for instance, cancer of the tip of the bile duct or parasites or some kinking at this point. There have been described by a number of authors such primary cancers which originated in the mucous membrane of the ampulla of Vater, the clinical picture of which they claim to be distinctive.

The following case is of interest as one of this class of painless jaundice:

CASE 1.—A male, 66 years of age, a farmer, came in October, 1901, complaining of severe jaundice which had developed rapidly, within four or five days, without pain. This painless jaundice, loss of flesh and frequent bowel movements were the first evidences to him of any illness, but, on further questioning, the following details were obtained:

Two years before, he first noticed a tendency to looseness of the bowels. Four or five months later, the stools became pale-colored, "putty-like," foul-smelling, small in amount and unsatisfactory. By the end of the first year they occurred once or possibly twice during the night, and three or four times during the day. Nine months later he noticed a very slight soreness just below the eighth costal border, which has continued till the present time. Three weeks ago, he first noticed jaundice, severe itching and dryness of the skin. He had lost 40 pounds in weight, his usual weight being 200 pounds. He felt energetic, active, appetite good, and complained of nothing but the jaundice.

His family and past personal history were negative. He had never had a venereal disease, nor had he used alcoholics. He had never been troubled in any way with indigestion; nor had he ever had bilious colic, a previous jaundice, nor any serious pain or discomfort referable to the abdomen.

Physical examination showed temperature normal, pulse 68. The thoracic and abdominal organs showed nothing abnormal except the liver, the upper border of which was in the sixth, eighth and tenth spaces, but the lower edge could be felt rounded, two fingers' breadth below the ribs. The gall bladder was outlinable to percussion and palpable as a pear-shaped, slightly tender body, pointing toward the umbilicus.

The urine was 1,024 acid, dark coffee colored, and contained a trace of albumin, no sugar, a large amount of bile pigments, many large and small hyaline, cellular and pigmented casts, a few renal cells and leucocytes.

A blood count at 10 a. m. showed 6,600 white cells, 5,600,000 reds, and a hemoglobin index of 74 per cent. The normal digestion leucocytosis was present, the count being 10,000 after a meal.

This was the last of November. The patient was not seen again for six weeks, during which time he had a severe tonsillitis with abscess formation. When seen in January, 1902, his urine was scanty and contained a large amount of albumin, bile pigment and casts; no sugar. There was marked edema of the legs and abdominal wall, and a large amount of ascites.

The jaundice persisted until death. There was no pain except that, dull in character, due to the gall bladder distension. Death occurred January 30, thirteen weeks after the first appearance of jaundice; two years and three months after first noticing the frequency and loss of color of the stools.

A summary of his history is:

Two years and 3 months ago frequent putty-like, pale colored stools.

Six months ago soreness at right costal border.

Five months ago sudden painless jaundice, rapidly deepening in 4 to 5 days.

Loss of 40 pounds in weight in one year.

Death 2 years and 3 months after onset.

The diagnosis had been cancer of the head of the pancreas. At the autopsy made by Dr. Parker, formerly assistant in pathology at Western Reserve University, a cancer of the tip of the common bile duct was found within the duodenal wall. The gall bladder was greatly dilated, measuring 12 ×6 cm., and had fallen down till its long diameter was parallel to that of the liver. This explains its not being felt late in the disease. The common, pancreatic and cystic ducts were greatly dilated. The hepatic ducts were dilated up into the liver and were surrounded by a fibrosis.

An anomaly in the ducts was present in that the cystic duct passed alone, parallel to the hepatic duct, entering it just before the latter's entrance into the intestinal wall; also, the hepatic duct united with the duct of Wirsung in the head of the pancreas. The common duct, therefore, extended only from the pancreatic head to the duodenal wall, 1 cm. The bile papilla was very small. Dr. Parker says: "On opening the papilla a mass of dense hard white tissue is found. This tissue occludes all the entering ducts. It is fairly well localized, forming a patch about the size of a quarter." The growth was an adenofibroma. There was no metastases. The pancreas was of increased firmness.

The bit of duct between the junction of the common bile duct and the pancreatic duct and the bile papilla in the duodenum is called the ampulla of Vater. It is contained almost entirely within the duodenal wall as it passes obliquely through it. It is of slightly greater diameter (4 to 5 mm.) than the bile duct above and the orifice below. Its length, as measured by Opie, varies from 0 to 11 mm. In 11 cases in 100 the pancreatic duct opened on the duodenal surface by a separate orifice. This small duct common to the pancreatic juice and bile is the cavity in which gall-stones occasionally lodge and is the second most frequent seat of beginning

cancer of the ducts.[1] Hanot[2] speaks of such an orificial cancer occurring at the point of transit between two types of epithelium. It is also interesting to note that in one other case of such a cancer[3] described, as well as the above, there was an abnormality in the duct formation.

The occurrence in an adult of a painless, rapidly deepening jaundice, without previous attacks of biliary colic and without fever, is the simplest form of duct obstruction with which we have to deal. It leaves no doubt as to the obstruction of one or more of the bile ducts either from disease within them or from pressure or constriction from neighboring organs. Of the former we have catarrhal jaundice, cancer, stricture, parasites and gallstones to consider.

A catarrhal jaundice occurs usually in children and young adults, is generally preceded or accompanied by gastric catarrh and fever and, above all, runs a short course of 3 to 4 weeks. However, Quincke remarks that "in old people an attack of simple catarrhal icterus may end fatally from long-continued stasis of bile." In such a case the diagnosis from a primary duct cancer without exploratory operation might be impossible.

Gallstones have been reported by several authors[4] as slipping into the neck of the gall bladder or even into the common duct and there causing a painless obstruction by pressure. This, occurring without previous attacks of pain referable to gallstones or gall-bladder disease, must be extremely rare.

We can conceive, and have seen instances, of a stone floating about the entrance to the cystic duct, as Fenger[5] describes, acting as a ball-valve, causing more and more dilatation of the duct orifice and finally becoming lodged so as to press against the hepatic duct as it descends to join the cystic, or by prolonged irritation causing an inflammation of the surrounding tissues including the hepatic duct and the lymph glands adjoining it and partially or completely obstructing it. But these must necessarily occur with some pain and characteristic attacks of chilly feelings, fever and other signs of contained fluid.

Fenger[6] and others speak of a parasite, an echinococcus or intestinal worm becoming lodged in the duct. These are rare and but need to be among the old files of our diagnosis scheme. The presence of parasites in the stools or a nationality or mode of life possible to echinococcus infection would be suggestive.

Of cancer of the bile duct Hanot groups the facts most clearly when he says: "Chronic progressive jaundice, apyretic, with decoloration of the fecal matter, no sharp pain, moderately enlarged liver, emaciation till death, five to nine months later, is characteristic of cancer of the tip of the common duct."

The attendant train of impaired digestion and absorption; the cholemia resulting in the nephritis, as well as the specific toxic effects, and the serous membrane inflammations, to which these patients are liable, all contribute to a loss of flesh and a lowered vitality, which in itself may bring the end or pave the way for intercurrent acute disease.

Hence an early diagnosis is essential and where the first sign of a disease is so definite as in this condition we may hope for much by early surgical intervention. I do not mean to say the first signs are diagnostic of anything but common duct obstruction, but, after a reasonable time of from 2 to 4 weeks for a possible catarrhal jaundice to subside, exploratory operation is indicated. This has been done, as will be later cited.

Of painless obstructions from without the duct we may have tumors of the pylorus, duodenum, pancreas, kidney, suprarenals, of the liver, of enlarged glands along the ducts and of echinococcus disease of any of these organs.

Authors mention an icterus gravidarum in which the uterine tumor presses on the colon, causing accumulation of fecal matter and by its pressure an obstruction of the bile duct. Other painless conditions of jaundice, such as that described as following strong emotions, after severe reabsorbed hemorrhage, during starvation, of syphilis, of the newborn, etc., all contain elements clearly distinguishing them from the present.

Of tumors of surrounding organs, if they had not caused sufficient pain to attract attention before causing duct obstruction, they would give signs such as a palpable tumor, gastric dilatation, signs of ulceration, etc., but in the pancreatic head there may occur a painless simple fibrosis, a scirrhus tumor, or a cyst capable of obstructing the choledochus as it passes by or through it.

CASE 2.—Mrs. M., aged 75 years, had always been in good health, except for typhoid as a child, and scarlet fever at 40 years. At 47 years of age, just before and following the birth of her last child, she had a severe painless jaundice which lasted 2 to 3 weeks, and disappeared without further sign. This sounds very much like an icterus gravidarum above mentioned. At 60 years of age she had an attack of severe pain between the shoulders lasting one-half hour and followed by no other signs. I saw her at 75 years of age, complaining of severe sciatica, loss of flesh, gastric distress and eructations, with occasional vomiting one-half to two hours after meals, no abdominal pain. There was diarrhea and pale-colored stools. The urine was negative. The blood count showed 3,093,000 reds, 8,800 whites, and 85 per cent. hemoglobin. She had never had an attack of bilious colic. Four weeks before death a marked painless jaundice developed. The diagnosis of cancer of the pancreas was again hazarded.

Autopsy revealed this condition with compression of the common duct. I am indebted to Dr. Howard for the pathologic diagnosis. In this case the obstruction at the lower end of the ducts was the tumor in the pancreatic head which had caused no pain. There were no gallstones.

The diagnosis of this condition from cancer of the duct which passes over or through the pancreatic head, or especially from a stone lodged at this point, is often of value by favoring timely operation.

Mr. Cammidge,[7] an assistant to Mr. Mayo Robson, has worked out and described a urine reaction which they hold to be of use in such a diagnosis. Of 28 cases of chronic pancreatitis, the reaction was positive in all. Of 6 cases of cancer of the pancreas, it was positive in but one. Of 61 cases in which there was no pancreatitis, it was negative in all. Mr. Mayo Robson[8] has been laying some stress on these results. Further reports are necessary. It is safe to say that pancreatitis, acute or chronic, can be diagnosed by the clinical signs, together with this reaction, if it is reliable.

Opie has clearly shown the relation which may exist between obstruction of the choledochus below the duct of Wirsung and pancreatitis. This pancreatitis frequently persists owing to a chronic inflammatory thick-

1. Rolleston: "Diseases of the Liver, Gall Bladder and Bile Ducts."
2. Hanot: "Arch. gen. de Med., November, 1896.
3. Klotz: Montreal Med. Jour., July, 1904.
4. Nothnagel: "Liver, Pancreas and Suprarenal Glands., p. 481.
5. Fenger: Am. Jour. Med. Sci., 1896.
6. Fenger: Trans. Am. Surg Assn., 1896.
7. Cammidge: Lancet, March 19, 1904 (Proof, Nov. 21, 1905).
8. Mayo Robson: "Diseases of the Pancreas." Hunterian Lecture, 1905.

ening or an edema of the ducts long after removal of the obstructing cause. From this we have a protracted period of impaired intestinal digestion which, in a patient of low vitality, may end in death. A drainage of the bile passages, not externally, but by anastomosis of the gall-bladder fundus into the duodenum, will improve this intestinal condition and at the same time drain the seat of the disease. The foregoing would have especial weight where a stone was the cause of obstruction.

We may be able by the aid of a better knowledge of the chemistry of digestion and by further analyses of urine and feces to make accurate diagnoses in this group of cases, but until that point is reached early exploratory operation with its practical absence of mortality is justified.

Three of these patients have been operated on, the growths excised and the duct implanted into the duodenum. Mayo[9] accomplished this by the duodenal route. "Recurrence after one and one-half years necessitated cholecyst-duodenostomy."

Halstead[10] excised the growth and implanted the choledochus in the duodenum. The patient died six months later of recurrence. Rixford[11] reports a case of adenocarcinoma at the ampulla, which, having been removed by a transduodenal operation, recurred in one year and caused death in fourteen months from operation. It is unfortunate that all these were of the adenocarcinomatous variety, while several are reported in which the growth was more scirrhus and without metastases.

The cause of death in the majority of cases has been the cholemia. Early operation, after time has been allowed for a possible catarrhal jaundice to subside, is, therefore, justifiable with drainage of the gall bladder into the duodenum or colon. With a better knowledge of the direction of the lymph flow from this region, early and free extirpation of growths, not only of the lower bile duct but of the duodenum, may bring good results, especially since these tumors do not form early metastases. Mr. Mayo Robson has suggested that cancer originating at this point is much more frequent than heretofore considered.

Sixteen cases have been collected by Rolleston[1] (p. 697), fourteen of which, he thinks, were "undoubted examples of cancer arising in the mucous membrane lining the diverticulum Vateri." Some of these I have mentioned, and, in addition, cite a few references[12] not noted by him. Those given contain ample bibliographies.

112 Lennox Building.

9. Mayo: Boston Med. and Surg. Jour., 1903, vol. cxlviii, p. 545.
10. Halstead: Johns Hopkins Hospital Bulletin, No. 103, January, 1900.
11. Rixford: THE JOURNAL A. M. A., vol. xxxvi, p. 1492.
12. Moore, Norman: Bradshaw Lectures, Lancet, 1889, vol. ii, 415; Fercol: Bull. de la soc. med. d'observation, 1859-63, p. 123; Dickinson: N. Y. Med. Jour., 1879, vol. xxx, p. 149; Whittier: Trans. Assn. Am. Phys., 1889, vol. iv, p. 292; Lennois and Courmont: Rev. de Med., 1894, vol xiv, p. 291; Edes: Boston Med. and Surg. Jour., Feb. 28, 1901, p. 223.

The Auto in Winter.—With the addition to the present light car of a still lower gear and the attachment to the wheels of suitable gripping devices there is no reason why the future doctor's car can not wade through snowdrifts quite as deep as his horse could haul him through and in better time. I believe, writes Dr. P. E. Doolittle, in *The Automobile*, that within the next two years the doctors will demand such an all-the-year-round vehicle, and there are no obstacles in the way of the manufacturers meeting such demand.

THE TREATMENT OF TUBERCULOSIS OF THE URINARY TRACT IN WOMEN.*

EDGAR GARCEAU, M.D.
Gynecologist to the Boston Dispensary and to Out-Patients at St. Elizabeth's Hospital.
BOSTON.

TREATMENT OF THE BLADDER.

Within comparatively recent years the disease was thought to be incurable, but the results that have been obtained in the treatment of the disease have disproved this. Two factors have contributed to this end, better means of diagnosis and better means of treatment. At present it is possible to treat a tuberculous bladder ulcer locally, by applications which are made with as much accuracy as though the ulcer were on the surface of the skin. Hygiene has also played an important part in the therapeusis, as it has in tubercular affections of other parts of the body.

The prognosis of tuberculosis of the bladder and of the upper urinary passages is to-day most encouraging, and it has kept pace with the brilliant results that have been obtained in the treatment of the pulmonary affection.

For purposes of convenience we may divide the subject of treatment into three heads: Hygiene and climate, local treatment, and surgery.

Hygiene and Climate.—Early cases of the disease are sometimes best treated by a change of climate. The principal objects to be attained are: "First, avoidance of a new infection; second, putting the patient in the best possible physical state so as to develop his reparative power. In order to accomplish this end the following rules are imperative: First, permanent exposure to fresh air; second, free access to light; third, well regulated rest; fourth, carefully supervisal exercise; fifth, abundant nourishment; sixth, absolute obedience to the rules of hygiene; seventh, constant medical supervision."[1]

If a patient has the means and the time, this treatment will be the best to begin with. Cures have been reported. It is not within the reach of the poor, and it is not to be tried by those patients who are suffering intolerable torments. The latter class demand immediate relief.

A purely hygienic course of treatment is also recommended in those cases of very advanced urinary tuberculosis in which the whole urinary tract has been invaded, and both kidneys are diseased. In such cases, out-of-door life in a well-regulated sanatorium will give the most comfort, and there have been cases reported of unexpected arrests of the disease.

Local Treatment.—Vesical tuberculosis has two stages. The first is the one in which the miliary tubercles have not yet appeared in the bladder, and the only abnormality seen with the cystoscope are collections of bright red patches in which the tubercles are later to appear; the second stage is that of tubercle formation, with attendant caseation and ulcer formation.

In the first stage topical treatment does not do any good; on the contrary, injections of various kinds and local applications are intolerably painful, and can not do any good for the reason that they do not reach the seat of the trouble at all, the germs being imbedded in the tissues of the bladder and therefore beyond the reach of

* Read in the Section on Obstetrics and Diseases of Women of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

1. Burrell, H. L.: Boston Med. and Surg. Jour., vol. cxlviii, No. 26.

antiseptics. It is far better, in this stage, not to attempt local treatment, and the most that can be done is to enjoin rest and administer general sedatives. The urine should be made as bland as possible, and to this end large amounts of water and milk should be taken. Urotropin may be tried, without much hope of success, although it sometimes acts beneficially; as there is usually very little pyuria in this stage it is difficult to see how a great deal could be expected of this much used drug. For sleep, trional (sulphonethyl-methane, U. S. P.) sometimes works exceedingly well; in one of the cases noted it acted admirably and gave much needed sleep to a patient greatly in want of it. In this first stage of the disease a climatic change will sometimes do the greatest amount of good. But if a patient can not go away she should at least try to live a healthy life. Sleeping out of doors is to be advised. Avoidance of all kinds of work should also be insisted on. Rest in the recumbent position should be largely taken. Diet should be regulated, and in every way the patient should try to lead as careful a life as possible.

In the second stage of the disease, that in which the tubercle is breaking down and ulcers are beginning to appear, or have already appeared, a vast amount of good can be accomplished by intelligent treatment. The best of it is that the poor can be cured, for this treatment can be carried out in hospital practice. The treatment of the second stage may be summed up thus: The intelligent use of two drugs, corrosive sublimate and nitrate of silver. These are strong antiseptics, and have a positive curative action on the tubercle and the ulcer. Used in conjunction they sometimes eradicate the disease from an apparently incurable bladder.

The use of corrosive sublimate was first brought forward by Guyon, who wrote a number of articles extolling its value in tuberculosis of the bladder. The treatment consists of instillations of the solution of the drug every day, or if not daily, as often as the patient can support them. A solution of 1:5000 is first tried, thirty or forty drops being instilled drop by drop into the bladder very slowly, by means of a dropper or pipette; if greater amounts are injected severe pain will be produced and the patient will refuse further treatment. As toleration for the drug is attained the strength is increased until a solution of 1:500 is used. It is not well to use stronger solutions. After the first few treatments by the physician the patient may be instructed to make the applications herself. If the pain is intolerable a solution of cocain or eucain may be injected into the bladder before the corrosive is used. Hygienic rules as to mode of life should be followed, rest especially being insisted on. Internally duotal (guaiacolis carbonas, U. S. P.) may be given in the dose of ten grains three times a day. Morphia should be avoided if possible. The treatment has to be kept up for months before any decided improvement is noticed. Patience and perseverance are essential. Of course, if this treatment can be given under climatic conditions so much the better, the cure comes sooner. At the same time with the Guyon treatment the tuberculous ulcers will have to be treated with the nitrate of silver. This is best done by putting the patient in the knee-chest position, and, under cocain anesthesia, applying the silver stick, mounted on the end of a carrier, directly to the diseased surface, through a small cystoscope. It is best to give ether for the first application of the silver, as the whole bladder can then be thoroughly explored and the cauterization be most carefully and thoroughly done. After the first application it is not necessary to etherize again and the silver may be applied to the ulcer under cocain, the application being made as often as once a week or oftener if needed. An ulcer will sometimes heal rapidly under this treatment, even if there is a tuberculous kidney above the bladder discharging germ-laden pus into the latter.

Cases treated by the combined Guyon and nitrate of silver method are Cases 2, 9, 11, 12 and 18; Cases 9 and 18 were cured; the other three were much relieved.

The essentials for the successful carrying out of this method are: Correct mode of living on the part of the patient, and surgical cleanliness and infinite patience on the part of the physician. A simple tuberculous infection must not be complicated with a secondary infection through unclean instrumentation. Attention to routine aseptic precautions will ensure good results. It is needless to insist on proper mode of living. Diet, care of the body as regards sufficient amount of sleep, etc., are to be insisted on. Patience will be taxed. It may be months, perhaps years, before marked improvement occurs, but, when it begins at last, the progress toward recovery is sure and steady.

The more advanced cases of vesical tuberculosis demand constant supervision by the physician. A bladder which has been affected by tuberculosis for a considerable period will possibly have suffered from secondary infection. Here we have two germs to consider. Such cases present a very much inflamed vesical mucous membrane, with numerous granulations and many ulcers. In my experience these bladders are best treated by giving ether and cauterizing the whole mucous membrane with the solid nitrate of silver stick. There need be no fear of too deep cauterization, for the burning with the silver does not penetrate far into the tissues. Some hesitation was felt in applying this apparently rigorous method of treatment in the first case in which it was used, but the result showed that such fear was without foundation. Granulations, especially, are destroyed. Secondary contraction of the bladder has not been observed. The immediate relief given may, perhaps, be explained by the fact that the silver nitrate forms an albuminate coating which covers the whole vesical surface, thus protecting the sensitive membrane from the irritating urine. This coating is cast off very gradually and the last shreds are not expelled for a couple of weeks or more. During this time the silver has been destroying the granulations and has been stimulating healing processes, so that these processes have had a good start when the last shreds are voided.

Cases 6, 13 and 18 are examples of this method of treatment. All were advanced cases, and all were suffering severely at the time the cauterization was done. In Cases 6 and 13 the bladder was filled with granulations, which rapidly disappeared after the application. In Case 18 there were fewer granulations, but there was a large ulcer and numerous tubercles with considerable inflammatory changes in the bladder. All these cases were greatly relieved by the treatment, and they were all immediately relieved, the urinations dropping from thirty or forty a day to four or five a day, within a week; at the same time there was a feeling of comfort in the bladder which had not been felt for months before.

The ultimate result of these cases may be referred to here. Case 6 sustained immediate improvement after the ether cauterization, which lasted six months, during which time the patient urinated only three or four times a day and once at night. She was then treated with local applications of silver for occasional cropping gran-

ulations and finally made a good recovery four years after the general cauterization and six years after the nephroureterectomy. She has been completely well now for three years. In this case the vesical lesions were probably due to a secondary infection because typical tuberculous changes were not numerous.

Case 13 was a very bad one of right renal tuberculosis well advanced and probably left renal as well, besides a very badly inflamed bladder filled with small tuberculous ulcers and with granulations which bled at the slightest touch. Radical measures were not to be thought of. As she was suffering severely and as her physical condition was so far reduced by the loss of sleep in consequence of the half hourly calls to urinate, something had to be done. So her bladder was thoroughly cauterized under ether. The results were good, the urinations dropping to four or five a day and as many times a night. She left the hospital at the end of a few weeks in fairly good condition, comparatively speaking. She died a year later. The intermediate history is not known.

Case 18 presented a bladder different from the two preceding ones. There was a large tuberculous ulcer as well as severe inflammatory changes, a large patch of granulations and numerous tubercles. Her bladder was cauterized two weeks after nephrectomy and within a week the urinations had dropped from forty times a day to four or five a day. Relief in her case lasted several months. Then the symptoms returned and the bladder was cauterized with the actual cautery as an experiment, touching only the ulcerated areas and the tubercles. She was made decidedly worse thereby. Finally an artificial vesicovaginal fistula was made and she recovered under the Guyon treatment, eight years after the nephrectomy.

Surgery.—Should the Guyon treatment fail on account of the suffering which it may entail, and this sometimes happens, it is not well to delay in giving the instant relief which an infrapubic cystotomy will afford.

This relief after cystotomy is immediate. Patients resume their occupations, and above all they can sleep at night. A rubber urinal is worn night and day and if it is properly constructed and properly applied it will collect every drop of urine as it drips from the bladder into the vaginal receptacle which is part of the apparatus. This rubber urinal does not cause much if any irritation.

The after-treatment of vaginal cystotomy is simple and efficacious. The patient takes two boric acid douches a day under scrupulous aseptic precautions. She also administers the Guyon treatment herself. She also continues under the care of the physician who makes applications of silver nitrate to ulcerated areas. In the female the vaginal is the only route that need be considered for the cystotomy. The suprapubic operation possesses so many disadvantages that it is not worth considering.

In advanced cases of the disease, cases in which the bladder has not been properly treated from the start and has become thickened and contracted to a small receptacle holding a few cubic centimeters of urine, in other words, in those cases in which the patient is to be made comfortable until death occurs, a cystotomy offers the greatest possible relief. These cases are almost always complicated with renal involvement.

It is my belief that early cystotomy should be urged in a greater number of cases, provided the patient is willing to submit to subsequent careful supervision, and it is in these cases that the Guyon treatment will work well. It is not so painful to administer, for there is free drainage.

Case 9 is illustrative. The patient had to earn her living and it was necessary that she should have a proper amount of sleep to enable her to undergo the labors of the day. A cystotomy was accordingly performed, with immediate relief. She slept well and at once and began to gain in weight. The Guyon and nitrate of silver treatment was then given for two years with the greatest persistency and care. It was thought that a secondary infection at least would occur; but it did not, for the patient was unusually intelligent and followed instructions. At the end of two years, the patient having worked daily at book-keeping meanwhile, she was well, and the fistula was closed. The bladder now holds 190 c.cm. and the patient holds her urine three hours at a time.

Tubercular ulcers may sometimes demand excision. This will rarely be required, for it is only the deep ones that come in this class and deep ulcers are rare. Persistent use of nitrate of silver is to be tried before resorting to excision.

Granulations covering ulcers are sometimes seen. These granulations cover the ulcers with the greatest nicety and at times rise appreciably above the level. They present the appearance of red vascular tufts, bleeding at the slightest touch. The best treatment for them is curetting through a large cystoscope, the base being afterwards cauterized with silver nitrate. It is needless to say that curetting should never be done in an early case of tuberculosis in which the tubercles are just appearing. This opens up fresh areas which may be infected by the germs; besides it does no good.

TREATMENT OF THE KIDNEY AND URETER.

Incipient tuberculosis of the kidney is best treated by a change of climate, but unfortunately incipient renal tuberculosis is rarely diagnosed, and it is only when the disease is well along and has invaded the rest of the urinary tract that the diagnosis is made. If it has not gotten too much of a start, and this may be fairly accurately determined by the amount of pus in the ureteral urine, it is worth while to try the effect of climate. Great benefit may result.

At the same time it should not be forgotten that this treatment may be most disappointing. I have in mind the case of a young man, twenty-one years old, in whom tuberculosis started in the apex of the right lung. The disease was taken at the very onset, at as early a time as it was possible for one to make a diagnosis. He was sent to Egypt under the most favorable auspices, and remained abroad for a year. He then returned home apparently well and with no evidence of active process in the pulmonary tissue. He had hardly arrived home when he began to have pains in the right lumbar region, and there soon succeeded "drop" hematuria.

This brings up another point with reference to the disease, and that is, the frequent association of tuberculosis elsewhere in the body with the urinary tuberculosis. A few years ago I looked up the statistics of autopsies performed at the Boston City Hospital and the Massachusetts General Hospital.[2] Among 3,424 autopsies there were 24 cases of caseous renal tuberculosis. In all the cases, without exception, there was evidence of tuberculosis in some other part of the body, the lungs and

2. "Operations for Tuberculous Kidney," Annals of Surgery, October, 1902, p. 516.

intestines heading the list. This predominance of tuberculous lungs and intestines suggested these organs as primary foci, inasmuch as they are in direct communication with the outside air. Judging from this alone, the urinary tract might have been infected secondarily, and this view of the case seemed to be strengthened by finding old pulmonary foci in two of the cases, while in two others a mediastinal lymph gland and a retroperitoneal gland were presumably the originating sources of infection.

This point has a decided bearing on the question of operation on the kidney, for no one would willingly do a nephrectomy in the presence of tuberculosis elsewhere in the body, if it could be avoided. There can be no question that an advanced tuberculosis of the kidney is best treated by removal of the organ. It can only do harm by being allowed to remain in the body and, as it is sure to cause death in time, it is worth while taking a risk in order to gain the comfort which a successful operation will give. Should there be an active focus elsewhere in the body it devolves on the surgeon to decide whether to operate or not. A moderate degree of pulmonary tuberculosis does not constitute a barrier to the operation, although the prognosis is thereby rendered less favorable as regards immediate recovery and subsequent good health. A patient who is suffering intolerable torments from kidney and bladder may elect to take additional risks.

The mortality attending nephrectomy is still high. I[3] found it to be 17 per cent. in a series of 101 cases collected from various sources. But this percentage is so much less than that in earlier lists (Bangs, 21 per cent., and Facklam, 26 per cent.) that it seems probable it will be still further reduced with improvement in technic and with a better selection of cases.

Nephrotomy as a curative measure need not be discussed. It has been amply proven that this operation is merely palliative and, if not followed by nephrectomy, will generally leave an intractable fistula. When the two operations have been done in succession the results have been brilliant, and in bad purulent cases this should be the rule of procedure. In a list of 47 cases in which this was done the mortality was 11 per cent.[4]

Resection is unjustifiable because one can never know if diseased tissue has been left behind.

The treatment of a tuberculous ureter is important. It should always be removed. As regards the mortality of ureterectomy it may be said that it is not to be greatly feared. Of course, personal equation counts here, and the skilfull operator has fewer deaths. In a list of 16 cases, there was but one death.[5]

Nothing will be said of the technic of the operation of ureterectomy, as that does not come within the scope of this paper. It may be remarked that a tubercular ulcer within the bladder at the site of the ureteral orifice may well be removed by excision with the lower end of the ureter. It does not add to the dangers of the operation, and the ulcer is well gotten rid of. It may also be said that if the patient's condition is poor at the time of the nephrectomy the ureter may be removed at a second sitting. If the ureter is abandoned we may expect further trouble. Fistula, secondary abscess, continuance and persistence of urinary symptoms are common, and in a number of cases tuberculosis of other organs has been the cause of death subsequent to the nephrectomy. When the lower part of the ureter is alone diseased, the kidney above being healthy, it is difficult to decide what to do. As extension to the kidney is pretty certain to be the outcome, nephroureterectomy must be thought of, although, in the case of a bladder not badly diseased, it might be well to try the effect of climate.

3. Loc. cit., p. 519.
4. Loc. cit., p. 518.
5. Loc. cit. p. 520

ANALYSIS OF RESULTS.

Of the 18 cases there are but 3 absolute cures, Cases 6, 9 and 18 (16 per cent.). Patient 6 has been well two years; patient 9 has just recovered and patient 18 has been well two years. This is a discouraging result, and shows the serious nature of the disease. It is worth while considering, though, that in both Cases 6 and 18, the kidney was diseased, yet recovery occurred. It is also worthy of note that cures were effected in Cases 9 and 18 by cystotomy combined with the Guyon treatment. Patient 12 has experienced great relief, and has had little vesical trouble for three years; she urinates 4 times a day and not at all at night; but there is still a slight degree of pyuria. She refuses further examination. Patient 11 did well, but still has some vesical irritability associated with pyuria. She lives at a distance and can not be reached. In Cases 1, 3, 4, 5 and 10 there was more or less relief. Six of the patients died (33 per cent.) from the immediate effects of the disease (Nos. 7, 8, 13, 14, 15 and 17). Patient 2 died from an intercurrent affection. Patient 16 is in the advanced stages of the disease and will die soon.

These cases have been exclusively personal and the histories cover a period of about ten years in all, beginning at a time when Kelly's cystoscope opened up the field for vesical diagnosis, and especially treatment of the bladder in the female.

PRIMARY SEAT OF ORIGIN OF THE DISEASE.

The question of primary seat of origin of the tubercular process, kidney or bladder, is an interesting one. This is a difficult problem to solve on account of the many factors which enter into it. In two of the cases the bladder alone was affected, Cases 9 and 17. In these cases it was positive that the bladder alone was the primary seat of origin of the disease, for the ureteral urines were examined and no evidence of renal involvement was discovered.

These two cases of strictly localized vesical tuberculosis have an important pathologic interest, because it has never been definitely ascertained how often the bladder is the primary seat of tuberculosis of the urinary tract. Some authors go so far as to say that the bladder is never the primary seat of origin of a tubercular process, while others are equally certain that it is much more common to find tuberculosis originating here than in the kidney. Assuming that the cases mentioned were, in fact, cases in which the kidneys and ureters were free from tuberculous disease, the bladder alone having been affected, we find that they constitute 11 per cent. of all the cases.

This deduction is not conclusive as to the total number of cases in which the bladder might have been the primary seat of the disease, for it necessarily does not include those cases in which the disease might have started in the bladder and afterwards ascended to the upper passages, along the ureteral canal or through the lymphatic system.

Let us now look at the problem from the point of view of the kidney. In the first place the notes of the cases do not show a single instance in which the kidney was the sole seat of the disease at the time the patient came

under observation. This means that the trouble was not recognized by the patient as a sufficient reason for seeking medical advice in the early stages of the disease. In other words, the process may remain latent in the kidney for months, if not years, without giving any more evidence of the serious nature of the affection than an occasional pain in the lumbar region on violent exertion. It is only when the bladder has been reached that distressing symptoms occur which demand relief. Case 15 is an example of this nature, the renal symptoms having antedated the vesical symptoms by several months. Case 18 is also an admirable example of the same nature. This patient gave the history of pain in the lumbar region on the right side for many years before the first appearance of any vesical disturbance. Case 1 is another example. This woman also had suffered from renal pain for many years. So long had the last two patients suffered in this way as to raise the doubt that the original renal affection was tubercular. Possibly they both had some other disease of the kidney on which the later tubercular affection had become engrafted. This further complicates the problem.

Eleven had positive renal involvement, Cases 1, 2, 3, 6, 7, 10, 13, 14, 15, 16 and 18. In all of them there seemed to be sufficient evidence of a tubercular process in the kidney, as evidenced by physical signs and by a rigid examination. In eight, Cases 1, 3, 6, 7, 10, 13, 15 and 16 the corresponding ureter was simultaneously diseased. In three, Cases 2, 14 and 18, the ureter was apparently free from infection. Of course, it is not always possible to affirm that a ureter is or is not diseased by the means at our present command. In the eight cases, with the exception of Case 3, the ureter was enlarged vaginally; in Case 3 it was the upper part of the ureter that was enlarged, as was discovered at operation. Among the remaining seven cases there was positively no renal disease in Cases 9 and 17; but in the other five it was doubtful, judging from symptoms or from physical signs; these latter were Cases 4, 5, 8, 11 and 12. In Case 4 there was an enlarged ureter vaginally; in Case 5 there had been right renal pain for three years, but the patient could not be catheterized; the patient in Case 8 was lost sight of, but it was learned that she died with "a tumor in the left side under the ribs;" in Cases 11 and 12 there is still pyuria, although the patients are much relieved; they refuse further examination. If we may assume that there is renal involvement in Cases 4, 5 and 8, these added to the eleven in which it was positively ascertained that the kidney was affected, give 14 out of 18 cases, or 77 per cent., with renal involvement.

This analysis does not help us much in solving the question. We can only say that renal involvement appears to be pretty constant, but we are left in the dark as to how often the primary origin is in the kidney.

It would seem that some light might be cast on this subject if physicians would pay more attention to complaints of lumbar pain localized on one side and complained of for some considerable length of time. If, in such cases, a careful examination of the urine were made as a routine practice, and if such examination showed pyuria, a cystoscopic examination should be made at once in order to detect its source. In many such cases the kidney might be found to be the seat of a tubercular change. Such a routine practice would help us to determine in which organ, kidney or bladder, a primary tuberculosis is commoner. It would also result in inestimable advantage to the patient, for it would be made possible by an early diagnosis to give the sufferer the great benefit of early climatic treatment, so important in these cases.

CASE 1.—Mrs. J. H. B., May 19, 1898, age, 36, American.
Family History.—Negative.
Tuberculosis Elsewhere.—None apparent.
Symptoms.—Constant pain in kidney since 1882; vesical irritability since 1895; gradual loss of strength and flesh.
Examination.—Large mass under r. ribs; no cystoscopic exam.; condition of ureters not determined; bladder urine contained pus, blood, casts, epithelia; no t. b. found; guinea-pig test positive.
Parts Involved.—Bladder; r. ureter; r. kidney; probably primary in kidney.
Treatment.—May 19, 1898; r. nephrect. (Dr. F. H. Davenport). R. ureter much enlarged and gristly; l. *in situ*; kidney disorganized and filled with pockets, cheesy pus; tuberculosis.
Remarks.—Bladder symptoms never marked.
Date of Last Note.—Letter received Feb. 27, 1906, states that she urinates 6 t. d., and 6 n't; no dysuria or hematuria; urine fairly clear most of time; no pains anywhere except in back, on exertion only; general health good; sleeps well; works every day.

CASE 2.—Miss E. B., June 14, 1903, age 30, American.
Family History.—Mother d. "meningitis." Otherwise neg.
Tuberculosis Elsewhere.—Tubere. of l. lung.
Symptoms.—Vesical irritability since June, 1902; painful miet.; "drop" hematuria.
Examination.—Cystoscope: large ulcer next to r. uret. orifice; general injection; bladder urine contained pus, blood, epithelia, casts and t. b. $\triangle = 1.36$; l. uret. urine too small to exam., $\delta = .51$.
Parts Involved.—Bladder, l. kidney.
Treatment.—Nephrot., July, 1903, sudden kidney abscess (Dr. C. L. Scudder); silver nit. for ulcer, duotal; corros. subl. (Guyon), February and March, 1904; grt. relief followed.
Remarks.—Tubercular vesical ulcer on side opposite to that of kidney lesion; grt. relief, Guyon treatment; l. kidney inactive.
Date of Last Note.—April 5, 1906. Sudden anuria ushered in with severe r. kidney pain; nephrot. immediately; decapsulation; urine immediately flowed from bladder and loin; death at end of 18 days.
Autopsy: Small uret. stone impacted at upper third of uret.; l. kidney disorganized.

CASE 3.—Mrs. A. C.,[6] Jan. 19, 1899, age 37, American.
Family History.—Mother d. pul. tubere.; mother's family all phthisical.
Tuberculosis Elsewhere.—None apparent.
Symptoms.—Pain in back since 1880; pain in l. lumbar region 3 mos.; pain in bladder when urine is retained; loss of flesh; vesical hemorrhages; severe one in 1880, another in 1881; smaller ones since; many lately; clots.
Examination.—Cystoscope; many small ulcers throughout the bladder; r. uret. urine contains pus, casts and epithelia; no t. b. found; l. uret. urine neg.; guinea-pig test positive.
Parts Involved.—R. kidney; uret.; bladder.
Treatment.—R. nephrec., April 8, 1899 (Dr. Edw. Reynolds); upper part of uret. also removed, tubere.; kidney adherent to post. abdom. wall by firm adhesions; tubere. cortex, papillæ and pelvis.
Remarks.—Crossed symptoms. Did adhesions to post. abd. wall have anything to do with peculiarity? Cure of vesical lesions by means of persistent use of silv. nit. before nephrec.; recurrence, same train of symptoms, after interval of 6 years.
Date of Last Note.—Feb. 24, 1906. Complete relief for 6 years after operation. In July, 1905, severe vesical hemorrhage; then incontinence, urine; pyuria; vesical irritability; cystoscope showed numerous ulcers in bladder; condition of l. kidney not ascertained.

6. This patient's case was reported by Dr. Edward Reynolds in Bul. Free Hosp. for Women, vol. I, No. 1. She was first seen by the author and then passed into Dr. Reynolds' care

CASE 4.—Miss J. C., Feb. 14, 1906, age 23, American.
Family History.—Neg.
Tuberculosis Elsewhere.—None apparent.
Symptoms.—Backache, 2 years; pain in lower abdomen; tired; vesical irritability 5 years; no pain, except when urine is retained.
Examination.—Kidneys neg.; r. uret. neg.; tender over l. uret. from its middle down; vaginally, l. uret. much thickened; cystoscope; general injection; many small tubercles in stage of repair; patch of gran. tissue to r. of l. uret. orifice; bladder urine contained pus, t. b., epithelia, small gran. casts, and some blood; r. uret. urine neg.; l. uret. urine contained epithelia, few small gran. casts, some pus cells.; guinea-pig test neg.
Parts Involved.—Bladder; lower part l. uret.; probably primary in bladder.
Treatment.—Patient had been living in open air a year before exam.; much more comfortable since adopting this mode of life; sent back to country; no local treatment.
Remarks.—Guinea-pig test failed; clinical and microscopic exam. unequivocal.
Date of Last Note.—April 5, 1906; doing well.
CASE 5.—Mrs. N. C., March 2, 1905, age 60, Irish.
Family History.—Son d. "pleurisy;" grandchild d. "meningitis."
Tuberculosis Elsewhere.—None apparent.
Symptoms.—Pain in r. kidney region since 1901; pain in bladder since November, 1894, felt after urination; vesical irritability since 1902.
Examination.—Cystoscope; general injection, swelling, several ulcers of moderate size; bladder urine contained pus, epithelia, blood, hyal. and gran. casts, and t. b., free and in clumps.
Parts Involved.—Bladder and probably the r. kidney.
Treatment.—Desultory; silv. nit.
Date of Last Note.—April 4, 1906. Patient still has vesical trouble; frequent mict. attended with pain; periods of remission, during which she is fairly comfortable.
CASE 6.—Miss C. C., Sept. 30, 1897, age 22, Irish.
Family History.—Negative.
Tuberculosis Elsewhere.—None apparent.
Symptoms.—Pain in l. kidney region and vesical irritability since September, 1896; some incontinence; pain in urethra on urinating.
Examination.—L. kidney much enlarged; l. uret. enlarged abdominally and vaginally; resistance over kidney and uret.; cystoscope; general injection, swelling of mucous membrane, which bled easily, scars; bladder urine contained pus, epithelia, casts and blood; no t. b. found; r. uret. urine neg.; l. uret. urine contained pus, epithelia, blood and casts.
Parts Involved.—Bladder; l. uret. and kidney.
Treatment.—Nephroureterect., Oct. 25, 1897; kidney entirely disorganized by tubere.; uret. much enlarged, removed *in toto;* slow convalescence, fresh air, rapid improvement in bladder symptoms; loin fistula closed Sept. 7, 1898; bladder now showed gran. area over l. uret. orifice; silv. nit.; recurrence, bladder irrit., May, 1899; cystoscope showed bladder filled with gran. tissue; whole surface cauterized with silv. nit. under ether. Oct. 22, 1899, better; urinated 3 to 4 t. d., 0 n't.; bladder clean, except small red area over l. uret. orifice; from this time until May, 1903, patches of redness in bladder; nit. silv. Sept. 14, 1904; well; no bladder trouble; no pyuria.
Remarks.—Rapid improvement of bladder symptoms after thorough cauterization of bladder; persistence of "patchy" cystitis, yielding to silv. nit.
Date of Last Note.—March 1, 1906. General health excellent; gain of weight; bladder does not bother; urinates 2 t. d., 0 n't.; no dysuria; no hematuria; no renal pain; sleeps well; works hard every day and has done so since operation; good health for 2 yrs.; urine, 1,020; no alb.; ac. sed., neg.; no pus.
CASE 7.—Mrs. F. J. T., Sept. 15, 1903, age 22, Irish.
Family History.—Negative.
Tuberculosis Elsewhere—None apparent.
Symptoms.—Vertigo; loss flesh; diarrhea; pains in l. lumbar and hypoch. regions since 1901; vesical irrit, and pain in urethra on urinating, since 1896.
Examination.—L. kidney twice normal size; l. uret. much enlarged vaginally; large r. kidney; cystoscope; two ulcers; general injection; bladder urine contained pus, blood epithelia and t. b., $\Delta = .53$; r. uret. urine, clear, urea, .63 per cent. sediment, neg.; no urine collected on left side; $\delta = .58$; guinea-pig test positive.
Treatment.—Nephrec. l. kidney Sept. 29, 1903; kidney adherent to diaphragm; uret. large throughout; abandoned on account of collapse; complete anuria; nephrot. r. kidney, October 4; cystic kidney found.
Autopsy: Complete cystic right kidney; some cysts filled with grumous matter, pure calcic oxalate, others filled with clear fluid, giving urea, .63 per cent. same as found in r. uret. urine.
Parts Involved.—L. kidney uret. and bladder tubere; r. cystic kidney.
Remarks.—It was thought that the r. kidney was hypertrophied through compensation and l. enlarged on acct. of secondary changes; instead, l. was hypertrophied and tubere. while r. was cystic. Low urea on r. should have been heeded, but absence of urine on l. (reflex?) was misleading.
Date of Last Note.—Patient died Oct. 5, 1903.
CASE 8.—Mrs. M. F., Oct. 9, 1901, age 38, Irish.
Family History.—Negative.
Tuberculosis Elsewhere.—None apparent.
Symptoms.—Loss strength; indigestion; pain in l. lumbar and hypoch. regions since October, 1900; vesical irrit, and painful mict. for some time.
Examination.—Tenderness over course of l. uret.; l. uret. enlarged vaginally; l. kidney neg.; cystoscope, general injection, few ulcers, patch of gran. tissue on trigon; bladder urine contained pus, shreds, epithelia, blood, casts and t. b.; l. uret. urine contained casts, blood, epithelia, and very little pus.
Parts Involved.—Bladder; l. uret.; probably primary in bladder.
Treatment.—Curetted, Nov. 14, 1901.
Remarks.—Operative interference steadily refused.
Date of Last Note.—Patient died October, 1904. For many months preceding death there was large tumor in l. kidney region.
CASE 9.—Miss A. F., March 23, 1904, age 28, American.
Family History.—Negative.
Tuberculosis Elsewhere.—None apparent.
Symptoms.—Vesical irritability, 7 yrs.; severe, 5 mos.
Examination.—Kidneys and urets. neg.; cystoscopic; many tubere. in bladder; one large ulcer near l. uret. orifice; bladder urine contained pus, blood, a few casts, epithelia and t. b.; r. uret. urine neg.; few gtts. urine collected in 5 hrs. from l. uret. urine; contained a little blood and epithelia; guinea-pig test positive with bladder urine.
Parts Involved.—Bladder; primary vesical tubere.
Treatment.—Vaginal cystot., April 2, 1904; from July, 1904, until February, 1906, constant vesical irrigations with boric acid 2 t. d., daily instillations of corros. subl., occasional applications of silv. nit., occasional dosage with duotal; Feb. 24, 1906, urine free from pus; bladder looked healthy; May 16, 1906, fistula closed.
Remarks.—Perfect comfort after fistula was made; Guyon treatment carried on at home; patient has been earning living since fistula was made. Constant improvement and gain in weight since operation.
Date of Last Note.—Sept. 30, 1906. Patient urinates once in 3 hrs.; bladder is contracted; holds 190 c.cm.; being dilated by hydr. distension; comfortable.
CASE 10.—Miss G., April 12, 1905, American.
Examination.—Kidneys neg.; r. ureter thickened vaginally; base of bladder very much thickened; cavity holds not more than 30 c.cm.; cystoscope; red gran. membrane, ulcerated thoroughout, bleeding easily; bladder urine contains pus, epithelia, blood and t. b.
Parts Involved.—Bladder; r. kidney.

Treatment.—Resection of r. kidney, in 1903, by Dr. C. G. Cumston; relief from kiuney pains; cystot.

Remarks.—Bladder was so thoroughly diseased and reduced in size by tuberc. changes it did not seem possible to effect any improvement; incurable.

Date of Last Note.—Lost sight of.

CASE 11.—Mrs. C. H., April 21, 1903, age 50, Irish.

Family History.—Negative.

Tuberculosis Elsewhere.—None apparent.

Symptoms.—Headaches; vertigo; loss flesh; indigestion; occasional r.-sided colic and hematuria for 27 yrs.; occasional vesical irrit. for 27 yrs., but constant lately and attended with painful miet.

Examination.—Kidneys and urets. neg.; cystoscope; general injection; on post. wall of bladder large area calcareous matter; bladder urine contained pus, blood, epithelia and t. b.; impossible to catheterize either ureter.

Parts Involved.—Tuberc., bladder; evidence of old kidney stone.

Treatment.—Supra-pubic cystot., April 28, 1903 (Dr. C. H. Hare); calcareous matter removed; drainage for 6 weeks; closure; Guyon treatment with corros. subl. until March, 1904; at this time well; urination 3 to 4 t. d., 0 n't.; no pyuria.

Remarks.—Kidney has given no further trouble; had period of arrest of disease, lasting many mos.; recurred later.

Date of Last Note.—March 25, 1906, health good; bladder troubles a little at times; urinates 12 t. d., sometimes painful; no hematuria; some sediment in urine at times. Letter says: "Some pains in the region of the kidneys." Still has pyuria. (Probably still has the disease.)

CASE 12.—Mrs. A. H., April, 1898, age 39, English.

Family History.—Negative.

Tuberculosis Elsewhere.—None apparent.

Symptoms.—Vesical irrit. and painful miet. since April, 1907; loss flesh.

Examination.—Cystoscope, general injection; several ulcers about r. uret. orifice; bladder urine contained pus, blood, epithelia and t. b.; ureteral urines neg.

Parts Involved.—Bladder.

Treatment.—Silv. nit. for ulcers; corros. subl. (Guyon), begun April 25, 1898, and continued until Sept. 8, 1903, with almost no interruption; all ulcers healed; bladder practically well at the end of that time, a few red patches alone remaining; urination 4 to 5 t. d. and none at night.

Remarks.—This case did very well with Guyon treatment; patient was very faithful in carrying out details.

Date of Last Note.—Letter from patient March 1, 1906, says she has enjoyed good health 3 yrs.; urinates 4 t. d., 0 n't.; no pains; urine still has pus in it, possibly from vagina; declines further examination. This case might be classed as a cure.

CASE 13.—Mrs. S. J., March 18, 1905, age 35, Armenian.

Family History.—Negative.

Tuberculosis Elsewhere.—Old Pott's disease of the spine; healed.

Symptoms.—Loss flesh (40 lbs.); fever; headaches; anorexia; pain in both lumbar regions 5 mos.; pain over bladder since March, 1904; vesical irrit. (30 to 40 t. d.) since March, 1904; also painful miet. same time; abundant hematuria 2 wks.

Examination.—R. kidney tender to touch; enlarged; r. uret. enlarged vaginally; cystoscope; general injection; bladder filled with gran. bleeding at touch; small ulcers everywhere; stricture and pyoureter on r. side; bladder urine contained pus, blood, epithelia, casts and t. b., $\Delta = .97$; r. uret. urine contained pus, blood, casts and epithelia, $\Delta = 1.05$; l. uret. urine, same sediment as above; $\delta = .58$.

Parts Involved.—Bladder; both kidneys; r. uret.

Treatment.—Under ether whole bladder was thoroughly cauterized with pure silv. nit.; immediate relief; April 10, 1905, patient was urinating 4 to 5 t. d., 3 to 4 n't.

Remarks.—No severe operation deemed advisable in view of poor general condition and double renal involvement.

Date of Last Note.—Died Feb. 8, 1906.

CASE 14.—Mrs. O., June 7, 1899, age 35, American.

Family History.—Negative.

Tuberculosis Elsewhere.—None apparent.

Symptoms.—Since 1897 pain in both kidney regions, with vesical irrit. and painful miet.

Examination.—Tender over both kidney regions; r. kidney enlarged; cystoscope; general injection; whole bladder gran., red; bleeding easily; numerous ulcers; bladder urine contains pus, blood, epithelia and casts; guinea-pig test positive; r. uret. urine contains pus, blood, epithelia and casts; guinea-pig test positive; l. uret. same characteristics; guinea-pig test positive.

Parts Involved.—Bladder; both kidneys.

Treatment.—No operation advised.

Date of Last Note.—Died November, 1899.

CASE 15.—Miss A. P., July 24, 1905, age 22, German.

Family History.—Negative.

Tuberculosis Elsewhere.—None apparent.

Symptoms.—Headaches; pain in back and r. kidney region since September, 1904, date of bad fall; vesical irrit. and painful miet. 3 mos., only; hematuria of severe type, 3 wks.

Examination.—R. kidney region very tender; r. uret. much enlarged vaginally; cystoscope; general injection; ulcers everywhere; swollen mucous membrane; Harris' instrument failed to get urine; temporary anuria; bladder urine contained pus, blood, epithelia, casts, many t. b.

Parts Involved.—R. kidney; r. uret.; bladder.

Treatment.—R. nephrect. (Dr. G. G. Averill), July, 1905; kidney tuberc.

Remarks.—Primary seat of origin was evidently r. kidney, as evidenced by pain in lumbar region, which antedated first appearance of vesical symptoms by several months; history of fall is suggestive.

Date of Last Note.—Died Sept. 9, 1905.

CASE 16.—Mrs. M. Q., Jan. 15, 1899, age 32, Irish.

Family History.—Negative.

Tuberculosis Elsewhere.—None apparent.

Symptoms.—Backache; pain in r. kidney region since 1896; vesical irrit. and painful miet. since 1896; several attacks of hematuria lately.

Examination.—R. kidney region tender; r. uret. enlarged vaginally; cystoscope; general injection; numerous ulcers; tuberc.; bladder urine contained pus, blood, epithelia, casts, and t. b.; guinea-pig test positive; r. uret. urine contained pus, blood, casts and epithelia; guinea-pig test positive; l. uret. urine same characteristics.

Parts Involved.—Bladder; r. uret.; both kidneys.

Treatment.—Desultory; disappeared.

Remarks.—Tuberc. just beginning on l. side; disease has existed 10 yrs.; has had periods of remission during which she has been fairly comfortable; operative treatment declined.

Date of Last Note.—Seen April 4, 1906; wasted a good deal; much loss of flesh; has had severe vesical suffering; now urinates 5 to 6 t. d., 4 to 5 n't.; at times painful; suffers much pain in r. kidney at times; none in l.

CASE 17.—Miss D. R., Dec. 10, 1898, age 17, American.

Family History.—Sister d. "meningitis," maternal aunt d. phthisis.

Tuberculosis Elsewhere.—None apparent.

Symptoms.—Vesical irrit. and pain in bladder since 1891; pain on urination felt in urethra and transmitted to r. heel.

Examination.—R. kidney region tender; cystoscope; general injection; many tuberc.; bladder urine contains pus, blood, epithelia, casts and many t. b.; guinea-pig test positive; uret. urines neg.; guinea-pig tests neg. in both.

Parts Involved.—Bladder; primary vesical tuberc.

Treatment.—Desultory; attempted Guyon treatment.

Remarks.—There seems to be no question about primary vesical tuberculosis in this case.

Date of Last Note.—Died Oct. 12, 1899, by suicide.

CASE 18.—Miss K. S., June 5, 1896, age 21, German.

Family History.—Negative.

Tuberculosis Elsewhere.—Tuberc. glands of neck as a child; scars still visible.

Symptoms.—Pain in r. kidney region since a child; vesical irrit. and painful miet. since June, 1905.

Examination.—Large r. kidney; tender over r. kidney region; cystoscope; general injection; several areas gran. tissue, which bled easily; a large ulcer near r. uret. orifice; bladder urine contained pus, blood, epithelia, casts and t. b.; guinea-pig test positive; r. uret. urine contained pus, blood, epithelia, casts and t. b. in large numbers; l. uret. urine neg.

Parts Involved.—Bladder; r. kidney; from history, probably primary in kidney.

Treatment.—R. nephrect. June 20, 1896; cautery of whole bladder under ether, with pure silv. nit., July 10, 1896; grt. relief; urination dropped from 40 t. d. to 4 t. d. in one week; perm. potass. irrigations until May, 1897, not efficacious; in August, 1897, getting irritable again; Oct. 2, 1897, cautery of tuberc. and red patches with galv. cautery; made worse; Guyon treatment, February, 1898, until April, 1899; no improvement; artificial vesico-vaginal fistula, April 25, 1899; cease Guyon treatment; comfort; from now until March, 1904, boric acid irrig.; occasional applications of pure silv. nit. and injections of ichthyol and glycerin, March 12, 1904; Guyon treatment resumed and continued until Oct. 24, 1904, when fistula was closed, with success; patient has been completely well ever since; no pyuria; no vesical irritability.

Remarks.—Cure could have been effected sooner had Guyon treatment been instituted at time fistula was made.

Date of Last Note.—Patient has been well 2 years.

URINARY INCONTINENCE.

THE TREATMENT OF CERTAIN FORMS BY THE FORMATION OF A VESICO-VAGINO-RECTAL FISTULA, COMBINED WITH CLOSURE OF THE INTROITUS VAGINÆ.*

REUBEN PETERSON, M.D.
ANN ARBOR, MICH.

Incontinence of urine in the woman is usually due to a vesico-vaginal fistula. The ordinary varieties of such fistulæ are easily cured by plastic surgery if modern methods be employed. Even large fistulæ involving a considerable portion of the vesico-vaginal septum and surrounded by dense scar tissue can be successfully closed by loosening the attachments of the bladder, separating this viscus from the vaginal wall and closing the rent in the bladder wall by a separate suture. But there always will remain cases where the neck of the bladder and portions of the urethra have been so destroyed as to preclude the restoration of the sphincter urinæ muscle, so that continence will be established. Under such circumstances the surgeon must consider the following procedures:

1. He can construct by a plastic operation an urethra which will serve as a channel for the urine, but leaves the patient without control of the stream. This is always an unsatisfactory procedure as far as the patient is concerned. By various devices, such as tamponade of the vagina, the sphincterless urethra may be shut off and the urine controlled to a certain extent. But the patient is never completely satisfied and her dissatisfaction would seem justifiable.

2. He can utilize the rectal sphincter by diverting the urinary stream into the rectum either directly by an anastomosis between the bladder and rectum or indirectly through the formation of a recto-vaginal fistula with a subsequent closure of the introitus vaginæ.

The following case will serve as a text for the discussion of the last-named procedure:

History.—Mrs. P., aged 60, married, was referred to me by Dr. M. C. Strong, of Jackson. Her present trouble dates back one year, when she began to experience pain, burning and irritation in the neighborhood of the meatus urinarius. The pain was worse when she was on her feet; micturition was quite painful and has become more so recently.

Examination.—On entrance to my private hospital, Oct. 17, 1904, the meatus urinarius was found to be the seat of a growth the size of a cherry. It was dark-red in color and sprang from the upper and lateral walls of the meatus. The growth was somewhat hard and the induration extended up the urethra for about 2 cm. The inguinal glands were not enlarged. A piece of the growth had previously been removed and pronounced malignant by a competent pathologist.

Primary Operation Oct. 17, 1904—Removal of Growth at Meatus Urinarius.—A circular incision was made 1½ cm. outside and beyond the growth. The line of demarcation between the upper normal and lower injected mucosa was plainly visible and was situated about 2½ cm. above the meatus. The urethra was dissected out and amputated about 1 cm. above this point. The urethral mucosa was then stitched with interrupted silkworm-gut sutures to the vestibule. So much of the urethra was removed and the integrity of the muscular structures was so impaired that the expected incontinence followed. From the time of the operation the patient practically had no control over the urine. The amputated urethra healed by primary union and the patient was discharged Nov. 9, 1904.

The patient re-entered the hospital March 18, 1905. The incontinence had continued since the first operation and the patient complained of great soreness and irritation about the site of the operation. Examination showed the remnant of the urethral opening, measuring 1½ cm. in diameter. Through this opening protruded the bladder mucosa, forming an external tumor the size of an English walnut. The bladder mucosa was reddened and at one spot was a superficial ulcer 4 mm. in diameter.

Second Operation March 22, 1905.—Formation of a Vesico-Vaginal Fistula and Closure of the Urethral Opening for the Purpose of Curing a Prolapse of the Bladder.—A centimeter and a half incision was made in the vesico-vaginal septum 2½ cm. above the cervix. The edges of the vesical and vaginal mucosa were united by interrupted catgut sutures. The prolapsed bladder was replaced and the edges of the opening freshened outward for a distance of 2 cm. The clitoris and upper part of the labia minora were removed during this process. The aperture was closed by a continuous catgut suture, the overlying tissues being drawn together laterally by interrupted silkworm-gut sutures. Both wounds healed by primary union and the patient left the hospital April 12, 1905.

The patient consulted me again June 3, 1905, complaining bitterly of the irritation arising from the continual flow of urine from the vagina. Examination showed perfect closure of the urethral opening, with no bulging. There were great reddening and signs of irritation about the vagina, labia and buttocks, arising from the continuous urinary flow. The patient asked that something be done for her relief and elected the following operation after its disadvantages and advantages had been fully explained to her:

Third Operation, June 4, 1905—Utilization of Rectal Sphincter by the Formation of a Recto-Vaginal Fistula, with a Subsequent Closure of the Introitus Vaginæ.—The sphincter muscle was thoroughly stretched and partially paralyzed. A longitudinal opening, 2 cm. in length, was made in the recto-vaginal septum, just above the internal sphincter. The vaginal and rectal mucosal edges were united by interrupted catgut sutures. The remainder of the labia minora were removed, and the surface about the introitus freshened for a distance of 2 cm. The vagina was closed with interrupted silkworm-gut sutures, care being taken to prevent any strain on the stitches. The rectum was drained by means of a large-sized rubber tube. This tube was removed at the end of four days, after which time the patient passed her urine every two or three hours by way of the rectum, having, of course, perfect control over the urine. The vulva stitches were removed at the end of a week, union by first intention resulting. After

* Read in the Section on Obstetrics and Diseases of Women of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

the first few days there was one or two partially formed stools daily. The patient was fairly comfortable on leaving the hospital about three weeks after the operation. She experienced some pain just prior to the passage of the urine per rectum. This she attributed to gas passing upward into the vagina, as it was always relieved by the passage of the urine. The patient had to get up once or twice only in the night and was able to retain the urine about three hours in the day time.

Subsequent History.—The patient was very comfortable for a time. Then she found the urine was not passing freely and that straining and pain were of frequent occurrence. August 13, 1905, she was examined under chloroform, and, as suspected, the recto-vaginal opening was found contracted, thus preventing a free passage of the urine. The opening was now made 4 instead of 2 cm. in length, the work being done through the dilated anal opening. The vagina was carefully palpated and inspected and appeared perfectly normal. A catheter was passed into the bladder by way of the recto-vagino-vesical opening and a small amount of urine collected. Careful chemic and microscopic examinations showed this urine to be perfectly normal. For a time the patient was very comfortable. Then she began to have considerable pain in the region of the bladder and the urine seemed to irritate unless large quantities of water were ingested and internal antiseptics were administered.

March 10, 1906, she was again examined under chloroform. The recto-vaginal opening was patulous and admitted the forefinger with ease. The vesico-vaginal opening, however, was greatly contracted. This was dilated and a calculus 1½ cm. in diameter removed from the bladder. The vesico-vaginal opening was made twice its original size and urine withdrawn from the bladder for examination. Again it was found perfectly normal. The patient has been in good health since the removal of the calculus. The rectum apparently serves very well as a substitute for a bladder. She is able to retain the urine three or four hours and has to get up twice only during the night.

The credit of suggesting the utilization of the rectum and the anal sphincter as a substitute for the bladder and urethra is due to E. Rose. He operated on his first patient in 1872. The vesico-vaginal fistula resulting from the extensive destruction of the bladder wall was transformed into a vesico-vagino-rectal fistula with complete success so far as the rectal urethra was concerned. Death followed ten months later from a nephritis brought about by the previous attack of diphtheria. His second patient was operated on for an incontinence following extensive carcinomatous disease. It was a success so far as the function of the rectal urethra was concerned, but death resulted later from extension of the carcinoma. His third patient was operated on nineteen years before his final report.[1] The patient had had various operations for a vesico-vaginal fistula consecutive to a rupture of the bladder and was given up as incurable. A vagino-rectal fistula was made and the introitus closed. The patient had been employed as a maid of all work during the nineteen years and had been in good health. She not only urinated, but also menstruated through the anus, with no resulting infection, as far as could be observed, of either uterus or urinary tract. The autopsies on the first two patients showed no signs of inflammation in rectum or vagina.

INFECTION AS A SEQUEL OF DIVERTING THE URINE INTO THE INTESTINE.

Fortunately, the surgeon can speak more authoritatively on this point to-day than formerly. The results of experimental and clinical work may be summed up briefly as follows: The urinary stream, either from the ureter or bladder, can be safely diverted into the intestine for the purpose of utilizing the anal sphincter, if the vesical ureteral orifices remain intact. On the other hand, pyelonephritis in varying degrees of intensity always follows the anastomosis of the severed ureter with the intestine. I have gone into this subject at some length in a paper dealing with the anastomosis of the ureters with the intestine, which was published in 1901.[2] Hence I had no hesitancy, so far as infection was concerned, in advising my patient to submit to an operation for the formation of a rectal urethra. Infection is not to be feared, because in a vesico-vagino-rectal fistula the ureteral orifices remain intact and act as a safeguard against pyelonephritis. There are many cases in the literature where patients have lived for years without signs of kidney lesions after the formation of a vesico-rectal fistula from the passage of a vesical calculus into the rectum. Keen's case is particularly interesting. The introitus was closed for the relief of a patient suffering from a vesico-vagino-rectal fistula. Twenty-two years subsequent to the operation the patient was in perfect health, with no sign of renal infection. Additional proof is furnished by the present case, where two careful examinations of the urine removed months after the operation failed to show any signs of renal infection.

THE PASSAGE OF FECES INTO THE VAGINA.

I do not believe that this occurs to any great extent. Contrary to expectation, patients with rectal urethras do not suffer from diarrhea. They have one or two well-formed stools daily. Consequently the tendency of the fecal matter is to pass by the recto-vaginal opening. In my experience patients with recto-vaginal fistulæ are not so much annoyed by the passage of feces as of gas by way of the vagina. Any slight amount of fecal matter finding its way into the closed vagina will be washed back again into the rectum by the constantly flowing urine. In the reported cases, my own included, particular mention is made of the freedom from irritation of the vagina.

THE FISTULOUS OPENINGS.

The truth of the above remarks are more or less dependent on the size of the newly-formed recto-vaginal fistula. Obviously, if the entire septum should be removed, the feces of necessity would pass into the vagina. Hence the opening must be neither too large nor, on the other hand, too small. Dread of the passage of the fecal matter into the vagina led me at the primary operation to make the recto-vaginal opening too small, necessitating subsequent enlargement. I believe it can with safety be made four centimeters in length. Its width should be two centimeters or less and the edges of the rectal and vaginal mucosa should be brought together with sutures to prevent subsequent contraction. The vesico fistula should be made a trifle smaller and if the edges of vesical and vaginal mucosa unite by primary union very little contraction will take place. Even in case of subsequent contraction the apertures can be easily dilated from time to time under an anesthetic, a procedure far preferable to enduring the discomforts of incontinence.

THE RECTUM AS A SUBSTITUTE FOR THE URINARY BLADDER.

Experimental work and clinical cases have shown that the rectum tolerates the presence of the urine and acts as a good substitute for the urinary bladder. The pa-

1. Deutsche med. Woch., 1903, No. 24.

2. THE JOURNAL A. M. A., Feb. 16, 23; March 2, 9, 16 and 23, 1906

tient has good control of the anal sphincter, the urine being passed, as a rule, only about once in two or three hours in the daytime and only twice at night. No irritation of the rectum seems to result.

CLOSURE OF THE INTROITUS VAGINÆ.

It must be borne in mind that the operation under discussion is for exceptional cases of such a nature as to preclude the hope of relief by plastic surgery. Hence these women are in a pitiable condition and should not be expected to perform their marital duties, much less expose themselves to the risk of pregnancy. At least in two cases closure of the introitus was made during menstrual life, and the women menstruated through the anus without any resulting ill effects. There is no particular difficulty in securing closure of the introitus at the first operation, provided the stitches are so passed as to preclude urinary contamination. The tendency of gas to pass from the rectum to the vagina can be combated to a great degree by a proper regulation of the diet.

DISCUSSION

ON PAPERS OF DRS. GARCEAU AND PETERSON.

DR. C. P. NOBLE, Philadelphia, said that he thought that Dr. Garceau was very moderate in his statements as to the curability of this condition. In his experience it is far more curable than Dr. Garceau stated. He operated on 16 women, and all of them recovered and are now in sound health. Without any exception they made perfect recoveries. With reference to tuberculosis of the bladder, the question of treatment resolves itself as to whether it is primary or secondary to the kidney, and by doing a nephrectomy or nephroureterectomy it will be followed by a spontaneous cure, if secondary. He has been surprised at the facility with which the women got well. The only man operated on by him, who had tuberculosis of the tract with lung involvement, died at a subsequent date. So far as early diagnosis is concerned, he long ago gave up all methods, with the exception of securing the urine and injecting it into guinea-pigs. This, he said, is the only certain way not to confuse the smegma bacillus with the tubercle bacillus. He is convinced of the curability of this trouble. In one case he was misled. He had a patient with tuberculosis of the kidney and bladder whom he sent home to die, but without any treatment she made a good recovery.

DR. J. WESLEY BOVÉE, Washington, D. C., agreed that the results depend largely on whether or not the disease is localized in those organs. The affections of the bladder disappear if the kidney and ureter are removed, but many cases are found in which not sufficient is done; that is, the kidney is removed and the ureter is left, and the disease tends to get worse. It is necessary to do more than one operation in these cases. Surgeons are not justified in saying that the bacillus is not found, because they are found in urine otherwise normal, so that the presence of the tuberculosis alone is not a positive indication as to the presence of tuberculosis in the kidney.

As to the cases reported by Dr. Peterson, one point is the danger of infection following the operation due to the contamination of the vagina and bladder with rectal contents. If the introitus is closed, the opening into the rectum should be near the sphincter. Make the closure higher in the vagina and get away from the sphincter, as irritation of it means more frequent evacuation. It is interesting to know, he said, whether the vaginal secretion has a bactericidal action on micro-organisms in the presence of urine, as it has in the absence of urine. If he were to do an operation diverting urine from the bladder to the rectum, making use of the rectal sphincter as a sphincter, he would form an artificial bladder from the rectum, bringing down the sigmoid and attaching it also, having the sphincter ani muscle act. In these cases it can be done as a preliminary procedure, and then the opening can be made through into the newly made bladder, and there would then be no risk of future contamination.

DR. EMIL RIES, Chicago, said that in the case reported, undoubtedly various other methods could have been considered, and one was mentioned by Dr. Bovĉe. He thinks in a similar way the Freund operation could be considered; that of turning down the uterus and utilizing it for plastic purposes. Freund's first case was operated in 1894 and the patient had exceedingly good sphincteric action. In Dr. Peterson's case the woman had passed the menopause. Perhaps, he said, the uterus in his case could have been used for sphincteric purposes. In the same way the Maydl operation can be considered. But the only one who can determine what is the best operation for the case is the one who had to do the work and had the case before him.

DR. R. PETERSON, Ann Arbor, Mich., said that the implantation of the trigonum with the ureteral orifices into the sigmoid or rectum (Maydl's operation) is the ideal method of diverting the urinary stream into the bowel. But it certainly is a more dangerous operation than the one he employed, and his patient was not inclined to take any unnecessary risks. He emphasized the point that when the vesical ureteral orifices are preserved intact, there is very little danger of ascending renal infection, no matter what method of anastomosis is employed. The presence of the calculus in his case should not be counted against the operation. Having nothing to go by, he made the openings between bladder, vagina and rectum too small.

CONSERVATIVE SURGERY OF THE OVARIES.*

EDWARD REYNOLDS, M.D.

BOSTON.

In recent literature it has been usual to speak of the conservative surgery of the uterine adnexa as though it were one subject. In point of fact, the resection of diseased tubes and the conservation of the ovaries belonging to them is usually brought to our attention in inflammatory cases and the question then hinges mainly on the condition of the tube, i. e., on the possibility of its restoration to functional value, as balanced against the possibility of reinfection of the pelvis from the patent stump. In this class of cases the condition of the ovary is usually a subordinate matter. These cases are etiologically in a different class from those which present normal tubes and neoplastic ovaries. They are also distinct clinically since in the latter class the decision rests wholly on the state of the ovary. I believe that confusion has been wrought, that clearness of thought has been lost, by treating the two classes as one. Though both are equally important, in this communication I limit myself to the subject of the surgical treatment of neoplastic ovaries with normal tubes.[1]

The advisability of the conservative surgical treatment of the ovaries must plainly be determined by observation of the ultimate results of such surgery in practice, and this is usually computed by statistical reports of a series of cases, to which is commonly added the judgment of the individual operator.

I think most of us are satisfied that the application of the strictly statistical method to questions of such comparatively vague nature as the ultimate influence of a conservative operation on the nervous system and general health of a patient is not only capable of producing any result to which the general judgment of the reporter

* Read in the Section on Obstetrics and Diseases of Women of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

1. From a clinical standpoint there are of course cases in which cystic ovaries are attached to inflamed tubes or in which the tube attached to neoplastic ovaries is slightly inflamed, but even from a clinical standpoint the cases usually arrange themselves clearly into one or the other class and the existence of transitional cases may clearly be disregarded from the academic point of view.

tends; but is practically certain to result in support of the side of the case for which he is arguing. I find myself so little influenced in such matters by the percentages deduced from the tabulation of long lists of hospital or otherwise more or less forgotten cases, that in preparing myself for this paper I determined to limit my review of my own experience to the cases of those patients in my private practice whom I have been able to keep track of for at least a year and a half and who were at the same time recent enough for me to be able to retain some personal recollection of them in addition to my records. This gives me 29 cases operated on between December, 1902, and February, 1905. Most of these patients I have seen from time to time; the remainder I have looked up recently, and I have used the study of these 29 cases as a basis for the modification or confirmation of the general opinions which I have formed in the course of my work. I believe the deductions to be more valuable than they would be if they had been drawn from the much larger number of less closely observed cases of which I have records from my hospital and consultation practice. The cases quoted are briefly reported at the end of the paper.

My subject proper may perhaps be summarized as dividing itself into two questions: What ovaries should be subjected to conservative surgery? By what method or methods of technic should the ovaries so selected be treated? In the attempt to answer these questions I give, then, my own conclusions as deduced from experience, believing that this is the best contribution I can make to this discussion.

WHEN CONSERVATIVE SURGERY IS ADVISABLE.

In any consideration of the conservation of the ovaries it is necessary to remember, first, that there are two ovaries, and, second, that so far as our knowledge goes one ovary is functionally as satisfactory as two. There is a general impression among surgeons, with which I am personally inclined to agree, that the existence of distension from cystic disease in one ovary tends to excite the appearance of similar trouble in the other. It is my rule that if one ovary is extensively cystic, while the other is normal, it is better to remove the cystic ovary completely, even though it contains some ovarian tissue which might be conserved, but at the risk of further cystic disease. If both ovaries are considerably affected the better of the two should be operated on first by conservative methods. If it proves that but a small fragment of ovarian tissue is left, the same conservative efforts should be made on the other side; if, on the contrary, the conservative care of the first ovary leaves a substantially normal organ, and the second is extensively diseased, I think it is better to remove it. If both ovaries are slightly affected, as for instance by only one or two small superficial cysts, I think it is best that both should be subjected to conservative operation. For the rest, in applying the principles of conservative surgery to the ovaries, we must be guided partly by the physical and pathological characteristics of the individual neoplasms, and partly by the age of the patient; and as a matter of convenience in arrangement, I discuss the latter first.

The object for which conservatism is adopted is the preservation of the functions of the ovaries. These organs possess certainly two functions and possibly a third: First, their products are essential to conception; second, they govern or in some way are essential to the menstrual phenomena which are intimately connected with the woman's whole physiology during the central or active period of life; thirdly, they may or may not influence the woman's general constitutional condition through the reabsorption of a so-called internal secretion.

In the majority of cases child-bearing becomes unlikely at or about forty, and in most cases at that age the bare possibility of this which remains has usually become less important; menstruation ceases on an average about forty-five; in women after this age the only value of the ovaries lies in the somewhat hypothetical importance of their so-called internal secretion, and even the strongest advocates of this theory admit its decreasing importance as time goes on after the menopause. The value of conservatism should then be estimated differently for each of these three periods of life, i. e., for young women, for those approaching, and for those who have passed the climacteric.

In weighing the importance of preserving the ovaries in a given case the possibility and desirability of child-bearing stands first. It may be admitted that in young women with the prospect of maternity ahead of them it is always desirable to do the most conservative operation which offers a fair prospect of freedom from further ovarian disease, and if, in these days of the safe and easy performance of the lesser abdominal operations, the case is fully explained to the patient from a fair standpoint there are very few young women who will not cheerfully accept the possibility of a second operation of this nature after the lapse of some years, rather than lose both ovaries at the first operation. In women approaching forty, with whom the probability of child-bearing is decreasing or problematical, its importance will be decided by the social state, the existence of other children, and such considerations, and for women well over forty this consideration fails.

In my experience, however, the age of the patient is of perhaps equal importance as regards the government of menstruation, i. e., the amount of nervous trouble which may be expected after a castration, or avoided by a conservative operation. From puberty to maturity the tide of sexual life is rising and is one of the dominant forces in the woman's whole physiology, health and happiness. To dam it suddenly at this age spells a neurasthenic catastrophe in a very large percentage of cases. In some cases it may be necessary but it is always to be avoided if possible. From twenty-five to thirty-five the tide is full and is of almost equal importance, though I think a larger percentage of women will now avoid an actual nervous breakdown after a castration. From thirty-five on the tide is on an average ebbing. I think it is not generally appreciated that for many years before the actual cessation of the catamenia there is a gradual natural preparation for it. As a rule the intervals between conception lengthen, the sexual impulses slacken, and, with occasional exceptions, as the woman passes into middle age the sexual life becomes progressively of less and less dominant importance.

This point of the effects of castration I have been obliged to study from another set of cases. I have seldom been among the first to adopt new operations. I think I have been too slow in becoming convinced of the importance of the conservation of the ovaries in every young woman where it is possible. It is only within the last five years that I have been pursuing the conservative operations steadily, and with the many cases of destructive inflammatory disease, of malignant disease, and of the other conditions which render the retention of the

uterus inadvisable the list of total ablations in the middle-aged must always remain a large one. My own experience has been far too small. Again confining myself to my private practice and to those patients whose personalities I remember well and who fall within the same period of time I have been able to refer to a quite large list of such cases, and on reading over their records I have been confirmed in my previous impression that in women from 35 years of age and over the percentage of nervous disturbance from the forced menopause is an increasingly small one, until after forty it becomes insignificant.

Of late years in a comparatively small number of cases I have avoided the removal of normal ovaries in hysterectomy for uterine disease, but have seen no difference in the results and have become convinced that in women of middle age at least the importance of the so-called internal secretion is at most but trifling and, I think, non-existent, but on this point my experience is as yet too small to justify a firm conclusion.

My general position as derived from my experience is, that allowing for modifying circumstances the importance of conservatism varies inversely with the age of the patient; that on the average it is not to be advised after the latest thirties, but is to be insisted on in almost every instance in young women; and, again in my opinion, its importance is but little affected by the variations in the pathologic character of ovarian neoplasms, with the single exception of malignancy.

Malignant neoplasms are from their very nature excluded from consideration in conservative surgery, but in the surgery of the ovaries there may be one possible and rather theoretic exception, i. e., the existence of one normal and one malignant ovary in the case of a woman for whom pregnancy is especially desirable. In such a case it might be justifiable to leave the normal ovary undisturbed but under close observation.

CLASSIFICATION OF OVARIAN GROWTHS.

The pathologic classifications of benign enlargements of the ovary are still clinically blind. From the clinical standpoint we are very little, if at all, guided in our treatment by the pathologic question as to the origin of the cystomata from Pflüger's tubules, the Graafian follicles, the Müllerian ducts or the Wolffian body, and are mainly influenced by their physical condition, i. e., the size and number of the cysts and their situation in the ovary. A convenient classification of the benign growths is:

A. Cysts originating from the corpora lutea.
B. Dermoid cysts.
C. So-called simple Graafian cysts:
   1. Single or multiple of size sufficient to form tumors external to the ovary.
   2. Enlargement of the ovary by numerous small cysts within the stroma (Rokitansky's tumor).
D. Enlarged sclerotic ovaries.

TECHNIC.

The conservation of the ovaries seems to me of almost equal importance in all these varieties and even the technic of their treatment is affected more by the size and number of cysts, and by the physical characteristics of uniformly enlarged ovaries, than by their exact pathologic character. These lesions may be treated by:

A. Evacuation, puncture and removal of the lining membrane with or without suture.
B. Resection.
C. Bisection of the ovary and multiple puncture or resection.
D. Scarification or multiple incision of the surface.

Corpora Lutea Cysts.—The smaller cysts from the corpora lutea and those ovaries which contain not more than half a dozen small surface cysts from the Graafian follicles are peculiarly adapted to puncture of the cysts and the removal of the lining membrane.

If an ovary which contains a persistent and abnormally enlarged, and enlarging corpus luteum be seized between the thumb and finger in such a way that moderate pressure is put on the base of the cyst and the distal surface of the enlargement incised by the knife the whole mass may usually be expressed on to a sponge, leaving a clean surface of normal ovarian tissue behind it. The thin edges of the cyst may require trimming by the scissors but it is often surprising how small a surface is left after the removal of a cyst of considerable size, and in cysts of this character up to the size of an English walnut after the trimming of the thin cyst walls the surface left can usually be closed with a few fine sutures, without the loss of any ovarian tissue and leaving a normal organ behind it.

Cysts of the Graafian Follicles.—In similarly small cysts of the Graafian follicles if the ovary be seized in the same way and a pair of snap forceps is forced through the cyst wall while a sponge is held to catch the fluid, the forceps may be made to seize the lining membrane, and it is surprising how often by a movement of torsion of the forceps the whole lining or active portion of the cyst can be twisted out intact, and again without the loss of ovarian tissue. In many of these cases no suture is needed, the cyst wall of cysts as large as a hazel nut often shrinking together in such a way as to leave little or no cavity, and but a small puncture which has ceased to bleed before the operation is completed. The situation of that ovary is but little different from that which follows the normal rupture of the follicle. In instances which do bleed I have never seen trouble follow the insertion of deep sutures of fine silk, whipped over and over in such a way as to compress the whole base of the evacuated cyst. I have been surprised to find that the cases in which I have used fine silk for deep ovarian sutures have shown no more subsequent pain or trouble than when I have used an absorbable suture. After the removal of even four or five cysts by this method no ovarian tissue has been lost, and the organ is in a practically normal condition. The excision of each of numerous cysts would have left a much mutilated organ, but this process must be limited to fairly superficial cysts.

Careful perusal of my records shows that while a few cases treated in this way have temporarily had heavy and distinctly enlarged ovaries for a few months after the operation, the ultimate results have been exceedingly satisfactory. These were probably cases in which I underestimated the importance of oozing within the cyst cavity and neglected to place sutures where they should have been used, and the temporary enlargement in these instances was probably due to the formation and subsequent absorption of a harmless clot within the cavity. Unfortunately my records have seldom been detailed enough to enable me to postulate this, but the results make it tolerably evident. The cases to which I am limiting myself are not sufficiently numerous to warrant any statistical conclusion, but all have been subjected to careful depletion in after treatment whenever there was any reason for it, and so far I have not been obliged to operate a second time for any of these cases.

Large Cysts.—Dermoid cysts, large tumors from the corpora lutea and large single or multiple, so-called Graafian cysts must be treated by excision, and here I have learned of late a fact which I chanced on by accident and which I have reason to believe is known to but

few operators. I have seen several instances of large cysts varying from the size of an orange to that of the adult head which appeared to have destroyed the entire ovary, i. e., in which no trace of ovarian tissue could be seen about the pedicle of the tumor, but in which it was, nevertheless, possible to conserve a normal and practically normal sized ovary. The first of these cases was that of a young girl about to be married in whom both ovaries were much enlarged and for whom I had promised to save any scrap of normal ovary. One ovary was distended to, perhaps, twice the size of a large English walnut by a great number of small cysts. This I felt obliged to remove. The other consisted of a single cyst, evidently of so-called Graafian origin and of about the size of a small orange. Its walls were uniformly thin and translucent, except at the hilum, where they were thick and white over perhaps the basic fourth of the tumor surface. With little hope of finding any ovarian tissue, but in strict pursuit of my promise, I made a careful superficial incision through the edge of the thinner part until I had exposed the thin translucent cyst wall under it. Passing the handle of the scalpel into this and separating the thin internal wall from the thicker external portion by blunt dissection, I found a plane of cleavage and was able to shell out the thin walled cyst entire, hoping against hope that I might find some small portion of ovarian tissue about the hilum. To my surprise, the circle of thicker wall about the hilum so left retracted after the removal of the cyst into the shape and size and to all appearance the substance of a normal ovary. Several subsequent but less marked cases have led me to hope that there are but few cases of large single cysts of a benign nature in which this process may not enable us to preserve some portion of a normal ovary. I have gone into this phenomenon in detail, because, although it may be known to many of you, it is new to me, and, from conversations with a number of experienced surgeons, I am confident that there are some of you to whom it will be as interesting and unexpected as it was to me.

Rokitansky's Tumor.—The condition known as Rokitansky's tumor in which the ovary is distended by very numerous small cysts lying not only on the surface, but throughout the stroma, each being thin walled, simple, and with no noticeable lining membrane, demands a different treatment. Until recently I believed them unfit cases for conservative treatment. I still look on them as the least hopeful and would remove a well-marked ovary of this character if the other were comparatively normal and fitted for conservative treatment. My experience of the conservative treatment of these ovaries is still too limited to enable me to draw safe conclusions, especially as the cases which I have treated by the technic I am about to describe are all among the more recent from which I have dared to draw conclusions, but the few cases which I am able to quote are all improving enough to make me feel that I shall, with some caution, pursue this line in the future. The little knowledge that I have is empirical, but the stroma of these ovaries is always edematous, the ovaries feel uniformly tense and swollen, and, acting on the theory that this abnormal tension probably favored the continued production of the cysts, I have first punctured with a blunt instrument (a fine pointed small artery forceps) all the superficial cysts, then seizing each end of the hilum with compression forceps in order to lessen bleeding, and with the ovary drawn outside the abdomen and surrounded with gauze, I have bisected it from end to end and from the edge almost to the hilum, with the knife, and guided both by sight and by palpation of each half between the finger and thumb, have pushed the closed fine pointed artery forceps into every cyst that could be seen or felt, however numerous or small they might be. These numerous punctures sufficiently drain the ovary which becomes soft and flabby in the process. I have then removed the forceps from one end of the hilum, passed a needle, armed usually with fine silk, through the tissues below the ovary at about one-third distance in from the edge of the hilum and tied the suture tightly, thus cutting off about one-third of the circulation. Passing the needle again through the tissues below the ovary, I have drawn the thread around the whole ovary while the divided halves are held in apposition by the finger and thumb, and again passed the needle through the tissues below the ovary so that the stitch encircles the whole organ, holding one end of the divided halves together. Repeating this stitch again and again, the whole ovary is whipped together by successive encircling loops of silk, the needle being passed entirely beneath the ovary in the tissues of the broad ligament or through the ovarian substance, as from time to time may seem most appropriate and best calculated to hold the bisected halves in apposition. The stitch is then finished by a final knot which compresses the circulation at the other end of the hilum, again for about a third of its length, some two-thirds of the circulation being thus effectually cut off. I have reached this apparently somewhat reckless use of fine silk, or at times catgut, in the ovarian tissues by gradual stages, but have grown to be confident that deep stitches even of silk through the ovarian tissue produce no after pain or ill results. As a whole, the after history of these cases has been that such ovaries have been heavy and again enlarged somewhat after operation, and with some persistence of symptoms, but that both physical conditions and symptomatology have then gradually improved, and so far as I can see have been followed by eventual recovery.

Enlarged Sclerotic Ovaries.—The enlarged sclerotic ovaries I have considered until very recently entirely unfit for conservative operation in cases in which they were causing sufficient symptoms to demand any operation whatsoever, and I believe that substantially enlarged sclerotic ovaries have usually been removed by operators when met with as probably promising future trouble. In some cases in which I have met with them incidentally in the course of operations undertaken for other reasons, as, for instance, in myomectomies, and in which I was unwilling to remove them, I have freely scarified their surface with the knife, making parallel cuts from a sixteenth to an eighth of an inch deep and perhaps a quarter of an inch apart over the whole external surface of each ovary and have been inclined to believe that subsequent examination has shown that they have decreased in size, but the cases are too few and too recent to warrant any conclusions. I can only say that the treatment seems innocuous and promising enough to be worth trying when occasion offers incidentally.

CASE SUMMARIES.

CASE 1.—Mrs. C. W. (No. 2277). Referred by Dr. Hodgdon. Operation Nov. 1, 1904. Both ovaries about twice the normal size, and showing numerous small cysts. Right ovary, a corpus luteum, removed by excision, ovary split, and several small oblique cysts punctured with forceps, closed with silk. Left ovary several superficial cysts punctured and lining pulled out.

Sutured with silk. Suspension and appendectomy. Repeatedly and recently examined. Ovaries have remained small. No pregnancy.

CASE 2.—Mrs. W. (No. 1716). Operation Sept. 24, 1902. Right ovary size of lemon, removed. Left ovary, one cyst about size of a grape, punctured and lining pulled out. Numerous small cysts of Morgagni removed. Myomectomy of small fibroid, appendectomy, discission of os uteri. Recently and repeatedly examined. Remaining ovary has never enlarged. No pregnancy. Now under treatment for acid secretion.

CASE 3.—Miss F. (No. 1852). Operation Nov. 12, 1902. Left ovary normal. Right ovary enlarged by single cyst of Graafian follicle, punctured and lining pulled out, sutured with silk. Suspension and appendectomy. Recently and repeatedly examined. Right ovary somewhat large and heavy, not tender thirteen months later. Not seen again for six months, when right ovary was normal, and has so continued. Unmarried.

CASE 4.—Mrs. W. S. P. (No. 2104). Referred by Dr. Lovett. Operation Nov. 4, 1903. Right ovary about three times normal size owing to single cyst of Graafian follicle. Cyst excised and wound closed with silk. Left ovary, three superficial Graafian cysts, punctured and lining membrane pulled out. Not sutured. Appendectomy. Not seen for three years, but repeatedly reported as well in interval. April 26, 1906, both ovaries slightly large, especially the right, not tender, no symptoms. Complained of sterility. Cervical secretion normal, vaginal profuse, turbid, and acid. Under treatment for sterility.

CASE 5.—Mrs. H. P. (No. 2249). Referred by Dr. Benson. Operation June 27, 1904. Left ovary size of a hen's egg, multiple cysts. Removed by excision, leaving small portion of ovary near hilum, sutured with silk. Right ovary the same condition and treatment. Cysts of Morgagni removed from each tube. Suspension, appendectomy, trachelorrhaphy, perineorrhaphy. Not seen since convalescence, but repeatedly examined and reported on by her physician, a good diagnostician. Ovaries have not enlarged. No pregnancy. Operated on for peculiar sexual psychopathia, which has not improved.

CASE 6.—Mrs. W. A. (No. 2201). Referred by Dr. Mason. Operation Feb. 8, 1905. Left ovary, hemorrhagic cyst size of a normal ovary, resected, leaving ovary almost normal size. Right ovary, numerous small superficial Graafian cysts, punctured and lining removed. Neither tube thickened, both constricted and occluded in outer third, both resected. Recently and repeatedly examined. Ovaries have remained normal size. No pregnancy.

CASE 7.—Miss M. T. (No. 2050). Referred by Dr. Knowles. Operation Sept. 30, 1903. Right ovary, one cyst size of English walnut, excised and wound closed with silk. Left ovary normal. Suspension. Examined by Dr. Knowles March 19, 1906, who reports symptoms entirely relieved; no enlargement. Unmarried.

CASE 8.—Mrs. C. S. (No. 2274). Referred by Dr. Knowles. Operation Feb. 27, 1905. Both ovaries contained single, thin-walled cysts of the Graafian follicles of the size of small English walnuts. Both punctured, lining membranes pulled out and sutured with silk. Fixation, trachelorrhaphy, cystocele and perineorrhaphy. March 27, 1906, her physician, a good diagnostician, reports no symptoms, everything normal. No pregnancy, widow.

CASE 9.—Mrs. W. G. S. (No. 2311). Operation Jan. 9, 1905. Right ovary one, left ovary two small superficial follicular cysts, punctured, lining membranes removed, sutured with silk. Two cysts of Morgagni removed, appendectomy, trachelorrhaphy and perineorrhaphy. Recently and repeatedly examined. Ovaries normal. No pregnancy, but preventive measures employed.

CASE 10.—Miss E. L. D. (No. 2365). Referred by Dr. Bush. Operation Jan. 30, 1905. Left ovary, cyst size of normal ovary, excised and sutured with silk. Right ovary, one small superficial follicular cyst punctured, lining removed, not sutured. Cysts of Morgagni removed, appendectomy. March 20, 1906, reported by Dr. Bush cured. No ovarian enlargement. Unmarried.

CASE 11.—Miss A. F. (No. 2385). Operation March 17, 1905. Left ovary, three small follicular cysts punctured. Right ovary, cyst of corpus luteum, excised and sutured. Suspension. Slight thrombosis of left leg in convalescence. Repeatedly and recently examined. Normal. Unmarried.

CASE 12.—Miss E. L. B. (No. 2269). Operation Oct. 22, 1904. Right ovary, several small superficial cysts punctured and lining removed, silk suture. Left ovary, cysts size of English walnut excised, wound sutured, about one-third of ovary left. Appendectomy. Repeatedly and recently examined. Left ovary temporarily enlarged two months after operation, since normal. Unmarried.

CASE 13.—Miss L. J. R. (No. 2017). Referred by Dr. J. G. Clark, of Philadelphia. Operation May 29, 1903. Right ovary, one small deep cyst, ovary bisected, cyst removed with forceps, ovary sutured with silk. Left ovary, cystic throughout, removed. Both tubes occluded at fimbriated extremity, dilated and probed. Appendectomy. Seen one year later. Ovary normal. Has tuberculous sputum. Unmarried.

CASE 14.—Mrs. H. H. B. (No. 2204). Operation March 31, 1904. Right ovary, multilocular cyst size of an orange, excised, ovary saved, wound closed with silk. Smaller cyst of left ovary same treatment. Suspension. Examined about a year later, ovaries normal. No pregnancy. Separated from husband.

CASE 15.—Mrs. H. B. K. (No. 2165). Referred by Dr. Macdonald. Operation Feb. 8, 1904. Right ovary, luteal cyst size of hazelnut, punctured, lining pulled out, silk suture. Follicular cyst size of English walnut excised and sutured. Left ovary, small follicular cyst punctured and lining pulled out, no suture. Myomectomy, suspension. Four months later organs normal, and reported normal and no symptoms by her physician in March, 1906. No pregnancy.

CASE 16.—Miss J. G. (No. 2163). Operated on Feb. 4, 1904. Right ovary, dermoid, size of a lemon, removed. Left ovary, cyst size of a pullet's egg, excised, ovary preserved and sutured with silk. Appendectomy. One year later, ovary normal. Repeatedly and recently examined. Remains normal. Unmarried.

CASE 17.—Miss C. S. (No. 2152). Referred by Dr. Putnam. Operation Jan. 13, 1904. Right ovary normal. Left ovary, two Graafian cysts size of a filbert, excised and sutured. Appendectomy. Repeatedly examined during following year. Ovaries normal. Has married and been pregnant.

CASE 18.—Mrs. G. M. N. (No. 2143). Both ovaries enlarged, edematous, and containing small cystic follicles, punctured, lining pulled out and sutured. Right ovary large and apparently persistent corpus luteum, same treatment. Suspension and appendectomy. Repeatedly and recently examined, ovaries normal. No pregnancy, preventive measures.

CASE 19.—Mrs. F. W. H. (No. 2010). Referred by Dr. Houghton. Operation Sept. 26, 1903. Both ovaries, persistent corpora lutea about doubling size of ovaries, both excised, in both luteal cells have degenerated but contents have persisted and are probably increasing. Suspension and trachelorrhaphy. Four months later left ovary somewhat enlarged, but gradually decreased again to the normal under depletion. No pregnancy.

CASE 20.—Miss M. L. R. (No. 1999). Referred by Dr. Wormelle. Operation April 27, 1903. Left ovary normal. Right, one cyst, punctured, membrane pulled out, sutured. Division of persistent iliolumbar ligament, suspension, appendectomy. One year later, normal. Recently reported no symptoms. Married one week.

CASE 21.—Mrs. E. M. W. (No. 1983). Referred by Dr. Putnam. Operation April 6, 1903. Right ovary, three enlarged follicles punctured. Left ovary, luteal cyst size of walnut, excised, sutured. Appendectomy and myomectomy. Repeatedly examined during next eighteen months. Ovaries normal. Not since heard from.

CASE 22.—Mrs. F. G. M. (No. 1980). Referred by Dr. Torrey. Operation March 30, 1903. Right ovary normal. Left, one large and several small cysts punctured, membranes extracted and sutured. Suspension and appendectomy. Ovaries recently reported normal. Symptoms relieved. Twins.

CASE 23.—Mrs. O. W. (No. 1955). Referred by Dr. Wadsworth. Operation March 14, 1903. Both ovaries enlarged by numerous small enlarged follicles, multiple punctures. On left ovary one larger Graafian cyst, lining removed and sutured.

Suspension, appendectomy, perineorrhaphy. Thrombosis of left leg in convalescence. Both ovaries somewhat swollen about two months after operation, gradually returned to normal. Seen recently, well. One pregnancy since operation.

CASE 24.—Miss M. (No. 1936). Referred by Dr. Torrey. Operation Feb. 2, 1903. Right ovary, numerous small superficial Graafian cysts, lining membranes pulled out. Cyst of Morgagni removed. Left ovary, luteal cyst, excised, about half an ovary left. Appendectomy. No further symptoms. Seen recently. Well. Unmarried.

CASE 25.—Miss S. M. P. (No. 1933). Referred by Dr. Flanders. Operation March 31, 1903. Both ovaries contained numerous hemorrhagic Graafian follicles, all superficial, all punctured and membranes removed, stitched with deep silk sutures. Appendectomy. Seen recently and repeatedly. At the end of six months both ovaries somewhat enlarged, right sensitive. Under depletion gradual decrease in succeeding six months, now normal. Symptoms much improved. Still slight dysmenorrhea. Unmarried.

CASE 26.—Miss M. K. O. (No. 1806). Patient of Dr. J. K. Mitchell, of Philadelphia. Operation Oct. 31, 1902. Left ovary enlarged to double size by numerous deep small cysts, removed. Right ovary normal size, but contained numerous small deep follicular cysts. Multiple punctures, surface scarified. Seen repeatedly and recently. Ovary has remained normal size. Unmarried.

CASE 27.—Mrs. F. F. H. (No. 1697). Referred by Dr. Sabine. Operation April 15, 1903. Right ovary, cyst size of orange, removed. Left ovary, hemorrhagic cyst size of American walnut, punctured, membrane extracted, not sutured. Radical cure of hernia. Dudley's operation. Repeatedly examined. In succeeding six months ovary enlarged somewhat but again decreased. No pregnancy; 39 years old.

CASE 28.—Mrs. M. N. M. (No. 1677). Referred by Dr. Putnam. Operation June 11, 1903. Left ovary cystic throughout, removed. Right ovary, three cysts punctured and membrane pulled out. Appendectomy and trachelorrhaphy. Suppuration of abdominal wound in convalescence. Repeatedly examined. Ovaries remain normal. No pregnancy; 38 years old.

CASE 29.—Mrs. C. A. H. (No. 992). Operation March 30, 1904. Right ovary, enlarged by several small superficial follicles, punctured. Left ovary, cyst size of an egg, punctured, membrane pulled out, silk suture. Suspension, appendectomy, trachelorrhaphy. Seen recently. Normal, entirely well. No pregnancy. Preventive measures.

THE PRESENT STATUS OF CONSERVATISM IN THE SURGICAL TREATMENT OF TUBES AND OVARIES.*

JOHN EGERTON CANNADAY, M.D.
Surgeon in Charge Sheltering Arms Hospital.
HANSFORD, W. VA.

We all know that even the least of the atoms has its definite value and its purpose to fulfill in the harmonious whole of Nature's plan. We have been long taught when a limb was injured, a hand mangled or an abscess formed to make every effort to save the part. Until rather recent years these saving methods did not seem to apply to the pelvic organs of women at all.

SURGICAL TREATMENT OF OVARIES.

In view of the fact that pelvic lesions constitute a large percentage of every surgeon's cases, their treatment becomes a matter of momentous importance. The recognition of the value of the internal secretions or trophic influences of the ovaries has had a world-wide influence as regards the surgical treatment of these organs.

The elder Emmet expressed the hope that future generations might be allowed to go uncastrated. More than twenty years ago Schröder first advocated the preservation of the remnant of normal ovarian tissue that could be left in the removal of cysts. About that time August Martin reported a number of cases in which he had removed degenerated portions of the tube and ovary and saved the normal tissues. A few years later William M. Polk presented to the surgical profession his brilliant results, and then considerable attention was paid to the subject in this country. von Winkel, Hofmeier, Schatz, Zweifel, P. Muller and A. Palmer Dudley were all pioneers in this work. Considerable harm has at times been done by overenthusiastic followers of these men, the student often lacking the judgment of the teacher.

Lawson Tait was a most distinguished exponent of scientific hara-kiri. At present, were he living, he would no doubt be unpopular with most French statesmen and with our own President Roosevelt. Battey in America, Tait in England and Hegar in Germany set the pace for the wholesale removal of ovaries in three of the world's greatest countries.

In an address before the American Medical Association, the late A. Palmer Dudley said: "A quarter of a century ago he who would have advocated conservative surgery on the uterine appendages of woman would have been considered by the surgical profession at large as a fit subject for the asylum." A review of gynecologic events occurring during these last twenty-five years presents a wonderful panorama of wide sweep. We have had many stars in this often tragic drama of the surgical arena. Many of the makers of gynecology could see no avenue to success but that made by the radical removal of all that lay in their path.

It is unusual for the genital organs of the male to be sacrificed for any condition save malignant disease. In inflammatory disease of the testicle or vas deferens removal, as a rule, is about the last thing thought of. The repressed sex are entitled to some privileges as well. It is distinctly of no advantage to the woman to exchange one undesirable condition for another. The belief in the mind of the woman that she has lost the generative function; that she has lost some of the finer sensibilities of the sex; that she is unlike other women, is in itself to most women productive of much mental anguish.

VIEWS OF A NUMBER OF AMERICAN GYNECOLOGISTS.

Believing that a general consensus of opinion is of value in the discussion of mooted questions, I addressed circular letters of inquiry to thirty-five of the leading operators of this country and received extended replies from thirty-three of them. I inquired of each operator as to his favorite and usual method of treating diseased tubes, cystic and prolapsed ovaries, whether or not he had done ovarian transplantation and about what, if any, percentage of pregnancies had followed conservative work in his hands. Replies were received from Drs. H. C. Coe, New York City; Floyd McRae, Atlanta, Ga.; J. Taber Johnson, Washington, D. C.; Edward J. Ill, Newark, N. J.; Charles R. Robins, Richmond, Va.; J. G. Earnest, Atlanta, Ga.; William M. Polk, New York City; Joseph Brettauer, New York City; Edward McGuire, Richmond, Va.; William H. Humiston, Cleveland, Ohio; S. C. Gordon, Portland, Me.; Charles G. Cumston, Boston; A. Brothers, New York City; A. Vanderveer, Albany, N. Y.; Robert T. Morris, New York City; W. H. Baker, Boston; Charles Jewett, Brooklyn, N. Y.; H. J. Boldt, New York City; I. S.

* Read in the Section on Obstetrics and Diseases of Women of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

Stone, Washington, D. C.; Chauncy D. Palmer, Cincinnati, Ohio; S. Marx, New York City; A. Lapthorn Smith, Montreal, Canada; J. H. Carstens, Detroit, Mich.; Joseph Price, Philadelphia; Randolph Winslow, Baltimore; Miles F. Porter, Fort Wayne, Ind.; W. P. Manton, Detroit, Mich.; J. Shelton Horsley, Richmond, Va.; John B. Deaver, Philadelphia, Pa.; H. A. Kelly, Baltimore; E. C. Dudley, Chicago; W. E. Ashton, Philadelphia, and Henry T. Williams, Rochester, N. Y.

Most of the answers were replete with interest and suggestions. Drs. Coe, Williams, Ashton, Manton, Stone, Jewett, Morris, Brothers, Polk, Ill, and McRae slit open occluded tubes, do plastic work and otherwise attempt to restore in a measure normal physiologic conditions. Deaver practices the above methods in a very limited number of cases. Carstens is extremely conservative in dealing with cases under 35 years of age, very radical with those above that age. Boldt rarely resorts to conservative work on the tube. Vanderveer nearly always does radical work. Brettauer does radical work except in a few cases of hydrosalpinx. Gordon nearly always does radical work. Earnest favors conservative operations occasionally. Kelly, under rare condition when the patient is very desirous of having children, resorts to plastic surgery. Robins only does this sort of work when called to operate in cases of sterility. All of the other authorities mentioned expressed themselves as in favor of radical work in all cases of tubal disease. Most of them believe either in nowise disturbing a tube or in removal in its entirety. With the exception of Marx, who thinks entire removal for the prevention of recurrences the best procedure, these men puncture cystic ovaries with knife or thermocautery. Most of them scrape out the lining and close the cyst cavity by sutures if of much size. Several practice resection of portions of the ovary for this condition. Practically all ovaries contain small cysts. Craig and others have called attention to a distinction between true cysts of the ovary and distended Graafian follicles which often attain a diameter of 2 cm. before rupturing. Occasionally a secondary operation will be necessary by reason of the rapid recurrence of cysts.

Deaver considers ovarian prolapse rare except when associated with malpositions of the uterus. He corrected it by securing the uterus in proper position. E. C. Dudley suspends the ovary by doing plastic work on the broad and ovarian ligaments. Most gynecologists who have expressed an opinion on this subject say that the ovaries should be stitched to the broad ligament. Earnest makes a slit through the broad ligament, passes the ovary through this and secures it, as it were, on a shelf by the use of one or two sutures. Marx believes most cases of ovarian prolapse are due to varicocele of the broad ligament. Humiston attaches the ligament higher up on the uterus. Edward McGuire fastens the ovarian ligament to the abdominal wall at times.

But few have had any experience whatever in ovarian transplantation. Boldt and Brothers occasionally transplant the ovary to the uterine cornu after the removal of an impermeable tube. Morris has had an extended and interesting experience both experimental and clinical in this sort of work. By his experiments on rabbits he has shown that after transplantation the host of the borrowed ovary may become pregnant, that the tissues of one animal are not kindly disposed to those of another, that the transplanted ovary in heteroplastic grafting degenerates in a few weeks or months. He has in several cases succeeded in ameliorating or preventing the distressing symptoms of the artificial menopause by this means. Morris, I understand, has been working on a serum with which he hopes to overcome in a given case that destructive tendency for the tissues of another. He has been successful in homoplastic grafting, but not so in heteroplastic procedures. According to recent reports, a patient of his became pregnant and was delivered of a normal baby after her own ovaries had been removed and one from another woman substituted.

The estimates of the percentages of pregnancy after conservative work on tube and ovary are all small, somewhere in the neighborhood of 1 per cent. Many operators report no cases of pregnancy whatever after plastic work on the tube. A great many pregnancies have followed conservative work on the ovaries. The percentages given by different operators vary from 5 to 10 per cent. Marx has had conception follow the leaving of minute portions of ovarian tissue. McGuire reports pregnancy following the complete removal of one tube and ovary, the removal of three-fourths of the other ovary and the outer third of the remaining tube. Many of these men strongly favor palliative treatment before an operation is ultimately decided on. All, of course, are radical in the removal of pus tubes. There is considerable variance in the minds of operators as regards what constitutes conservatism. Many do without any operation whenever possible, and when they do operate make a clean sweep, holding that to be a truer conservation than an operation which carries with it the possible risk of a second resort to surgical relief.

CONSERVATIVE OR RADICAL WORK?

In the surgical treatment of diseased conditions of tubes I would deem it advisable to do plastic work provided the inflammatory process had been rather remote and the damage done to the tube was comparatively slight, that there were no evidences of tuberculosis or malignant disease, that the woman had at least a few years' grace before the menopause was due, that some healthy ovarian tissue could be left and that there were no positive contraindications to a future pregnancy. There is often in these cases a possibility of the restoration of function, the woman may become pregnant and the possibilities of future trouble from the tube are rather remote in properly selected cases. Conservative operations for the ovary are indicated when the woman has not passed the menopause, when the ovary is neither the seat of malignant disease (including tuberculosis) nor of pus infection, when the ovary is cystic, and when it is intended to free the ovary from adhesions.

The conviction on the part of most physiologists and gynecologists is that the ovary has another function aside from that of ovulation, the production of an internal secretion which passes into the circulation and assists in maintaining the physiologic balance of the body or the distribution of trophic influences having the same effect. The knowledge on the part of the woman that she is forever sterile will in some cases give rise to mental disturbances and even melancholia.

The chief indications for the radical removal of tubes are the presence of tuberculosis, malignant disease, acute inflammations and pus.

The disadvantages of tubal repair work are the unlikelihood of a return of normal function (this takes place occasionally) and the risk after an unilateral operation of a recurrence in the opposite tube. If the interior of the uterus is properly treated, this danger is slight. As to the chances of ectopic gestation, a case has not been

reported. H. A. Kelly states that the cilia are rarely destroyed by acute inflammation and never by catarrhal trouble. The dangers of infection following the opening of a tube which contains no pus are exceedingly slight. The mortality in carefully conducted laparotomies of election is so low that the danger from a secondary operation *per se* may be said to be almost *nil*.

One of the principal reasons urged against conservative methods in dealing with cystic ovaries is the fact that cysts often soon re-form. It is believed by many that a small cystic ovary is much better than no ovary at all. By resection of a large part of the ovary the principal cyst-bearing portion may be removed. The presence of tuberculosis, of malignant disease, or of pus infection is generally considered to be an absolute indication for complete removal. I have removed an ovarian abscess 2 cm. in diameter along with one-half of the ovary containing it and had no bad result.

TECHNIC OF PLASTIC REPAIR WORK.

Perhaps no part of the body has greater powers of regeneration than the tube. Both normal tubes may be ligated near the uterine end with silk, and pregnancy may occur a few months later. In the doing of plastic work on the tube there are opportunities for the exercise of much surgical judgment and common sense. There must be a recognition to a nicety of the tube that must be removed and the one that may be saved. The club-ended tube can be slit open, the agglutinated and adherent fimbriæ teased out to their normal position or the mucosa may be attached to the peritoneal coat by means of fine catgut sutures. All adhesions binding the tube in unnatural positions should be broken up and the denuded surfaces covered with peritoneum. Some suture the amputated or opened end of the tube to the ovary, others fix a portion of the ovary inside the lumen of the tube, spread out the mucosa over as much ovarian tissue as possible and secure it by suturing. In simple stricture or obliteration of the isthmus some one has suggested resection of the affected part, followed by anastomosis of the ampulla to the cornual portion of the canal. The lumen of the tube may be kept open during the healing process by a cord of braided silk passing through it, one end attached to the ovary, the other after passing through uterine cornu and uterus being fastened to a bobbin placed in the vagina.

In opening contracted tubes the use of saline solution and a small syringe is deemed more safe and satisfactory than a probe. It is sometimes even possible for regeneration to take place in a pus tube after it has been drained vaginally.

The hard, cirrhotic and painful ovary having a tough thickened capsule may at times be benefited by the excision of a strip of the dense capsule. These cases are usually unsatisfactory to treat and after entire removal pain often reappears in the region of the cicatrix.

Ovarian adhesions, if present, should be broken up and raw areas given attention. Cysts should be opened and their lining membrane peeled out. This can often be done with tissue forceps and the walls of the sac approximated by fine catgut sutures. A small round needle having no cutting edge should be used in order to prevent unnecessary oozing of blood. When the ovary has the appearance of being badly damaged one can locate and preserve the healthy tissue best by splitting the organ open, opening superficial and deep cysts and removing unsound tissue with scissors. By removing with curved scissors an ellipse from the covering of a superficial cyst the edges can be neatly approximated. In the removal of large ovarian cysts in which pressure effects have destroyed most of the ovary, a small layer of thinned ovarian tissue can often be preserved at the base of the cyst and sutured into a sausage-shaped roll.

I have practiced conservative work in over fifty cases of ovarian or tubal disease, and so far as I have been able to follow my cases symptomatic results have been good. There has been no recurrence of tubal trouble, a very small number of cases of cystic ovaries has come to second operation for the removal of recurring cysts. Several pregnancies have followed resections of portions of the ovaries, but I have no record of a case of pregnancy following plastic work on tubes.

Ovarian prolapse is frequently associated with retroposition or other malpositions of the uterus, and hence can often be corrected by restoring the uterus to its normal position; this I often do by a modification of the Andrews operation. Otherwise I suspend the ovary either by shortening its ligament or by making a slit in the broad ligament near its top, passing the ovary through this and securing it on top of this shelf by a catgut suture on either side. During or after attacks of acute salpingitis the ovaries often become bound down in an unnatural position behind the uterus. On being freed from adhesions they may be saved in part by resections if not entirely disorganized.

The sudden bringing about of the menopause by operations that should be relegated to the back seat of necessity, may bring on a sudden change in the sexual feelings especially distasteful to the woman. The feeling that she may lose some of those delicate essentials of womanhood so peculiarly inherent in the sex often prevents a woman from submitting to much needed surgical treatment. Richter and others have concluded that castration in either the male or female is followed by a marked decrease in the gas interchange. The consumption of oxygen is lessened and the body takes on fat. Halban and many others have observed that the ovaries or testicles, as the case may be, are necessary to the development of the genitalia and that not only is their development arrested by castration, but that atrophy even occurs. This sudden bringing on of the climacteric being so at variance with the natural order of things endows the woman with obesity, hot flashes, chilly sensations, nerve storms, neurasthenia, hysteria, insomnia and other varying manifestations of a disturbed physiologic equilibrium. Often one variety of suffering is but exchanged for another and the last state of the patient is worse than the first. An operation neurasthenia sometimes develops that renders these cases most pitiable to the observer. The victim walks with difficulty from weakness and pain. She may have depression of spirits, vertigo, insomnia, disagreeable dreams, depression of spirits, a feeling of pressure on the head and crying attacks.

CONCLUSION.

I believe that, barring the presence of the menopause, inflammation, pus, tuberculosis and malignant disease, conservative work should be done; that every organ or part of an organ consistent with the health and well-being of the patient should remain undisturbed; that in these cases there is much room for exercise of good judgment and due discrimination; that the risks of infection and of secondary operation from portions left behind are rather remote in properly selected cases.

To summarize, I would say that the majority of the gynecologists interrogated favor a restricted conserva-

tism; that the number of pregnancies occurring after tubal operations is very small; that the results after plastic work on the ovaries is better; that age, the presence of pus, tuberculosis and malignant disease indicate, as a rule, radical work; that prolapsed ovaries, generally speaking, should be elevated in the pelvis by suspension operations on the uterus, by shortening the ovarian ligament or by placing the ovary in front and on top of the broad ligament; that the functions of the tube and ovary should be preserved whenever consistent with health; that the artificial induction of the menopause brings a very serious disturbance into the life of the patient, and that ovarian transplantation experimentally and clinically has, in a limited field, been productive of satisfactory results.

DISCUSSION

ON PAPERS BY DRS. REYNOLDS AND CANNADAY.

DR. W. M. POLK, New York City, said that the situation resolves itself into the question: How far may we go in preserving ovaries which are found to be diseased on being exposed in the course of a laparotomy? This is one of the most difficult questions before the profession to-day. Surgeons have not been able to say at the operating table whether or not an ovary belongs to that class which will reproduce a morbid growth that will embarrass the patient in the future. We must be able to determine this by the gross appearances. The descriptions in text-books of ovaries which are likely to cause pathologic conditions are misleading, he said. All follicular cysts are not apt to produce subsequent trouble, but the larger ones may. The question that faces us in the end is that of a secondary operation. As this is not a matter of life and death, but rather of health, it is our duty to lay the subject before the patient. If she prefers to retain menstrual function we are justified, he said, in ignoring the possibility of a subsequent pathologic condition. This is perfectly safe ground on which to stand. We must turn to pathologists and beg them to devise some method by which we can settle the question definitely at the operating table. The question of conservatism so far as the ovary is concerned, is in a far better way of solution than that which pertains to the oviduct. This is a crucial point. The virulence of an inflammatory process will determine whether there will be resolving salpingitis or one that will leave no hope of the tube ever performing its full function again; for while menstruation may be retained, the woman's reproducing function will be *nil*. When it comes to how much of an operation can be done to restore the Fallopian tubes the question turns on the condition of the operative field. If we can secure freedom from septic infection in this operation and secure a clear field which will leave the tubes in the condition in which they are placed, Dr. Polk believes the operation will be successful, but just as sure as conditions remain which invite an adhesive inflammation and closure of the opening, the work will be for naught. One, two, or a dozen cases do not always make the rule, but Dr. Polk feels that while there is a good deal to be done, the field is still one of the most promising that stands out before us, and he laid especial stress on experimentation with a view of testing the possibility of subsequent pregnancy on these cases.

DR. R. T. MORRIS, New York, said that in pyosalpinx and gonorrheal cases he formerly tried to save little except the patient's reputation, then he began to save a little ovarian tissue to retain the value of internal secretion, and it seems to him now that gynecologists may, with advantage, do some conservative work. When we have malignant disease we must not be guided by the patient's wish. There we must dominate. If there is a question of doubt one can make a spot diagnosis by frozen section. In cases of tuberculosis one can not do much conservative work. In cases of mixed infection we have our greatest field for conservative work. In the degenerative cases there is great opportunity for much conservative surgical work. There is certainly more pleasure in doing good work of this kind than in destroying or removing. Dr. Morris said that he has felt that grafting has but a limited field. He has gradually narrowed the field down to homoplastic grafting. Surgeons did heteroplasty and did not get much result from it, because one woman is intolerant to the tissues of another, but there are degrees of tolerance that may sometimes amount to complete tolerance. He said that he reported one case in which there was subsequent heteroplastic pregnancy and the child is living. Very many interesting questions arise, as for instance, who is the mother? Kelly says the mother is the one who gave the nutrition during the life *in utero*, and Clark says the ovary is the mother. This ought to be decided, as legally important questions may be involved. In conservative surgery, when a woman has lost her ovaries without possible chance of child-bearing, can we graft? There is a possibility, Dr. Morris said, that this one pregnancy can be repeated, but until tolerance can be established between the tissues of individuals heteroplastic ovarian grafting can not be done very successfully.

DR. F. F. LAWRENCE, Columbus, Ohio, declared that his experience in efforts at conservatism has been far from pleasing. One of the most distressing cases was one in which he made a resection of one ovary and one part of one tube. This woman was the mother of a child between 3 and 4 years of age, her husband in broken health. About seven months later he was called to see the woman, and found her dying as the result of a ruptured extrauterine pregnancy. He does not know whether his efforts at conservatism were responsible for that death or not, but, for several hours thereafter, and many times since, he has thought that had he done more radical work the woman would still be living. In three other cases it had been his misfortune to have to operate a second time for extrauterine pregnancy, in cases in which he had left one tube and ovary. We know that Nature will sometimes perform wonders in the way of repair, and yet if an ovary is sufficiently inflamed to become adherent, or if the destruction has been sufficient to produce sclerosis, what, he asked, can be accomplished by a resection. If, as many believe, all these inflammatory conditions are the result of infection, do we remove the cause of the suffering when we remove a part only of the ovary or tube which has been infected? Dr. Lawrence said that he believes in conservatism as much as any one can, but only in that conservatism which serves the future good of the patient—that conservatism which relieves not only the present suffering but subserves the entire interests, comfort, and health of the patient in the future. Another unfortunate sequel was in a case in which he made a resection of part of a small adherent ovary and tube. Some years previously this woman had been operated on by another surgeon who removed an ovarian tumor. She consulted Dr. Lawrence a short time after with the lower abdomen filled with papillomatous matter, for which he could do nothing. The question of separating adherent and infected Fallopian tubes seems to him to be almost, if not quite, parallel with the idea of separating the adhesions about the inflamed appendix, and leaving the appendix. If this be not good surgery in inflammation of the appendix why is it good surgery of the Fallopian tubes?

DR. SETH GORDON, Portland, Me., said that he is glad to know that Dr. Morris feels that he has finally gotten a pregnancy from heteroplastic work. Dr. Gordon has had one case of pregnancy occur two years after he did his best to remove the ovaries and tubes. He supposed that he had removed everything. Another patient was operated on by Dr. Chadwick and Dr. Gordon delivered her a year after she was operated on. There is not so much question as to who is the mother of the child in Dr. Morris' case. Dr. Gordon believes in the conservatism that does good to the patient. A great deal of good has been done in conservative surgery, as well as much harm. There was harm with what was called normal oöphorectomy, and there was a great deal more good in removing ovaries and tubes at that time. Dr. Gordon thinks the question raised by Dr. Morris is pertinent, viz., that the character of the infection is what we are to study most thoroughly. He believes that a man who does a conservative operation on any one with streptococcus or gonorrheal infection is doing criminal surgery unless he does a complete hysterectomy. We must study carefully, and while we have done good with regard to joint tubercular infection and peritonitis, the attempt to do any con-

servative surgery in this class of cases would also be criminal surgery. Palmer Dudley reported 1,200 cases of conservative surgery. Dr. Gordon declared that he knows Dr. Dudley reported them honestly, but before he died Dr. Dudley said he should have done hysterectomy in a great many of them. He said most of his work was experimental. While he had 20 or 30 pregnancies following, he still thought he had made mistakes in not doing hysterectomy more. Spencer Wells said that in a thousand cases he had had to do secondary operation fifty times.

DR. M. O. PANTZER, Indianapolis, called attention to a successful effort at conservatism in a case in which the pathology was of a kind generally conceded to include no promise. The case was reported in detail to this Section in 1903, and appeared in THE JOURNAL of the American Medical Association, Nov. 7, 1903. The heavily sclerotic, though not shrunken nor enlarged ovaries as found at the operation, afforded little incentive to a conservative effort. Rather this was supplied by the ardent desires of the couple to have offspring. One ovary was removed entirely. The other was pared of its thickened covering, leaving behind a small raw pyramidal portion. Menstruation, which had been retarded, now became regular, though still attended with much pain. The patient conceived five months after operation and went to full term. The unbounded happiness produced by the birth of a nine-pound boy came to full expression in a letter written to Dr. Pantzer by the mother.

DR. W. E. DORSETT, St. Louis, said that in retroversion and retroflexion there are cysts and painful ovaries that can be remedied by resection, and for the last four years he has been resecting the ovaries without any bad symptoms. These women go on menstruating without pain. In most of these cases an ovary is found that is not normal because it is cystic, and Dr. Dorsett slits it down to the hilus, scrapes out the cysts, and closes the incision, and the patient goes on menstruating without trouble.

DR. H. J. BOLDT, New York, said that the proper procedure is to exsect the tube and graft the ovary in the cornu of the uterus. Sometimes conditions are present where it is possible for us to preserve parts in young women and we should always do it. Dr. Boldt agreed with those who say that conservative surgery is fraught with danger.

DR. E. REYNOLDS, Boston, said that his experience and judgment in the resection of infected tubes is as much against it as it is in favor of conservative surgery in neoplasms of the ovary or tubes. That is also the consensus of this discussion. He agrees wholly with Dr. Polk that in this question of conservatism of the ovaries or tubes, it is the patient's life and health with which we are dealing, and her decision should be paramount; also, that we should not be opening the abdomen all the time for little cystic conditions in the ovaries. There is a great field for the conservation of tissue in large cysts. He said that Dr. Morris has furnished us with a question rather than a conclusion. Dr. Reynolds thinks that Dr. Gordon's comment that the occurrence of pregnancy after both ovaries had been removed was due to failure to remove the ovaries entire, deserved more weight a few years ago than it does now, but the possibility of leaving a portion of the ovary, the possibility of the existence of third ovaries is certainly still sufficient to require more cases than this of Dr. Morris' before we can assent to his conclusion. In the meantime it should remain an open question.

DR. J. E. CANNADAY, Hansford, W. Va., said that Kelly, after extensive experimentation, has shown conclusively to his own mind at least that inflammation of the tube very seldom destroys the cilia. Dr. Cannaday thinks that most gynecologists will agree that results can be accomplished by other means than hysterectomy in the treatment of endometritis. He also thinks that the woman should always be consulted prior to operation as to what she would prefer.

Institute for Chemical Research.—A scientific institute for the discovery and investigation of new chemical remedies has recently been opened in Frankfurt a. M., owing to the generosity of the late G. Geyer and his widow.

RELATION BETWEEN APPENDICITIS AND GALLSTONES.

JOHN G. SHELDON, M.D.
KANSAS CITY, MO.

Previous to about three years ago I attributed to postoperative and preoperative adhesions the abdominal pains, distension and constipation that sometimes remained after I had removed gallstones from a patient. Since I have been removing the appendix during operations for bile-passage diseases, adhesions have given me little trouble.

During the latter part of June, 1903, three patients from whom others had removed gallstones came to me complaining of pain in the abdomen, abdominal distension and constipation. Two of these patients gave definite histories of acute attacks of appendicitis occurring early in life; the third gave a history of long-standing "stomach trouble" before the biliary colics began; in all of them there was marked tenderness over the appendix areas. These three patients were operated on for appendicitis. Marked changes were found in the removed appendices and the abdominal symptoms disappeared. These cases suggested to me that perhaps I had made mistakes in treating some of my gallstone patients. I, therefore, communicated with all of them whom I could find, and found two were frank enough to admit that, although their gallstones had been removed, they were not well. These patients gave definite histories plainly suggesting the existence of chronic appendicitis long before the biliary colics had occurred. In both cases there was decided tenderness over the appendix. The appendices were removed. They showed marked and long-standing inflammatory changes. The abdominal symptoms disappeared.

From July 15, 1903, to July 1, 1906, I operated on 48 patients with gallstones and 7 patients who had appendicitis and cholecystitis without gallstones. In these 7 cases I was of the opinion that the cholecystitis was secondary to the appendicitis. In 2 of the 48 gallstone operations acute infection was presnt, and the appendices were not examined during the operations. One of these patients completely recovered; the other complains of abdominal symptoms and has tenderness over the appendix. He says that, while he suffers some, he is "not sick enough to have another operation." In the remaining 46 gallstone operations, the appendix was removed in each case. Five patients gave a definite history of having had typhoid fever; 3 of these had normal appendices, 2 had chronic appendicitis with no peri-appendicular changes. Two patients had gastric ulcers associated with gallstones; in one of these chronic appendicitis, with peri-appendicular changes, was present; in the other the appendix was normal. Thirty-nine of the 46 patients had appendicitis with gallstones, but with no history or evidence of typhoid or of gastric or duodenal ulcer. Twelve of the 39 cases of gallstones with appendicitis showed peri-appendicular changes. Pus was found in the appendix in four instances.

In 46 operations, removing gallstones and the appendix, the appendix was found diseased 42 times and normal 4 times. In 3 of the 4 normal cases the patients had had typhoid, and the other gallstone patient with a normal appendix had a gastric ulcer. Thirty-four of these 42 cases of gallstones and appendicitis gave histories plainly suggesting the existence of appendicitis ten or twelve years previous to the occurrence of biliary

colic. In 6 of these 34 cases a definite history of an acute attack of appendicitis was obtained; in 28 no history of an acute attack was given.

If it is true that the common method of infection locating in the bile passages is through the portal vein and that gallstones are only a stage in infection of the bile passages, there would seem to be a very definite etiologic relationship between gallstones and certain infections involving the intestinal tract or any part of the anatomy drained by radicals of the portal vein. We have believed for a long time that typhoid fever is responsible for some of the cases of bile-passage infection gallstones, but we have seemed to ignore the factor of appendicitis in causing bile-passage disease. It seems to me that the appendix and ileum are similar in their relation to the portal system. Both harbor the colon bacillus and both drain into the portal vein. If disease in the ileum-typhoid is associated with the entrance of colon bacilli into the portal vein, and these are excreted, as it were, by the liver into the bile passages, why can not disease of the appendix, which is more common than typhoid, result in bile-passage infection? It seems very probable to me that appendicitis, especially the long-standing varieties, is the cause of many bile-passage infections.

CLINICAL OBSERVATIONS.

Although from personal knowledge of the work of various surgeons, it seems probable that many recognize the association of gallstones with appendicitis, little has been written on this subject. Ochsner[1] reports 18 cases of gallstones in which the appendix was found diseased six times. In these cases the appendix changes were marked. Peri-appendicular changes were present in all these cases and pus was found in some of them. Moynihan states that he has often seen gallstones and appendicitis in the same patient, and suggests that the destructive lesions in the appendix may allow an infection of the portal blood.

Infection the Underlying Cause of Bile-Passage Disease.—It is generally agreed that cholelithiasis is only one manifestation of disease of the biliary passages and that infection is the underlying cause of bile-passage disease. The early work of Mignot and of Gilbert and Fournier has shown this conclusively, while in 1903 C. A. Ewald, before the Congress of American Physicians, showed that gallstones mean infection. It has also been shown experimentally by Mignot[2] that it is the mild and long-standing inflammations of the bile passages that especially predispose to stone formation, and that, experimentally at least, attenuated micro-organisms and mild inflammations are more efficient in producing gallstones than are virulent bacteria and acute inflammatory processes. It is also generally agreed that contamination of the bile is necessary for the occurrence of inflammation of the bile passages, and that the liver, by its bacteria-destroying powers, is a most important factor in preventing serious infections in the biliary apparatus. On account of the bactericidal properties of the liver, a limited number of infective bacteria of a low degree of virulence may be killed (Welch, Adami and others); or virulent infective organisms carried to the liver in large numbers may have their vitality much lowered and in being excreted through the bile passages may produce a mild inflammation instead of an acute and serious one. Knowledge of the condition of the bile in health is not a necessity in arriving at the cause of bile-passage infections. Herter says that during health the bile is sterile. However this may be, there is no question that in certain diseases and under certain conditions the bile is contaminated, and that this infected bile is responsible for bile-passage infections and, therefore, for the occurrence of gallstones.

How Does the Bile Become Infected?—If infected bile is essential to bile-passage infections, the micro-organisms must reach the bile through the blood or by ascending the common duct. So far as I know, there is no good reason to believe that the lymphatic system plays an important part in directly causing bacteria to reach the bile.

From the work of Sherrington, who, in 1898, showed that bacteria do not ascend the common duct unless stagnation of bile is present, and from observing the fact that many times the bacteria causing a cholecystitis are not the same as those found in the duodenum, it seems probable that ascending infection is not common in producing bile-passage infections. At present the trend of opinion favors the hematogenous origin of bile-passage diseases. Experimentally we know that this mode of infection is possible; clinically it seems probable. While it has been shown that bacteria circulating in the general venous and arterial currents are sometimes excreted in the bile, it seems that bacteria in the portal blood are more likely to be found in the bile and, for this reason, infections draining into the portal system may supply all the necessary conditions for bile-passage infections. Lortigan advocated this theory in 1902. In favor of the theory that infection of the biliary apparatus most often takes place by way of the portal vein is the occurrence of infected bile after ligation of the common duct, or even after tying one of the large bile ducts[3] and the common contamination of the bile in typhoid fever.

Diseases that Infect the Portal Blood.—If, as it would seem, it is true that bile-passage infections are caused by bacteria brought to the liver by way of the portal vein, the underlying cause of biliary infections would most probably be inflammatory or ulcerative processes localized in anatomic structures drained by the portal system. While it is claimed by Adami and Ford that during health bacteria are constantly finding their way from the intestines to the liver through the portal blood, it is probable that in most instances a diseased condition draining into the portal system is necessary to result in the production of definite bile-passage inflammation. It is generally admitted that portal blood and bile-passage infection occur very commonly during typhoid fever; and, while typhoid is not a very common disease, it is held responsible for a considerable number of the chronic infections of the biliary passages. If typhoid can be the underlying cause of bile-passage infections, why can not gastrointestinal ulcerations, intestinal tuberculosis, dysentery and chronic appendicitis afford a means for colon bacilli to enter the portal blood and to produce infection of the biliary apparatus? The recent work of Turck on gastric and duodenal ulcerations strengthens rather than contradicts the possible relationship between gastrointestinal ulcerations and gallstones. But of all these inflammatory and ulcerative conditions, chronic appendicitis is by far the most common, and it does not seem unreasonable to hold that a

1. Ochsner: Pennsylvania Med. Jour., Oct. 6, 1900.
2. Mignot: Brit. Med. Jour., 1898.
3. Homer: Centrbl. f. Path., vol. v, p. 825.

long-standing inflammation in the appendix may permit sufficient infection of the portal blood to cause bile-passage inflammation.

Chronic Appendicitis the Cause of Gallstones.—The frequency of the coexistence of chronic appendicitis and gallstones in itself suggests the possibility of a relationship between them. But if chronic appendicitis can cause gallstones, why do some patients who have chronic appendicitis have no gallstones? The power of the liver to destroy bacteria (Welch) would seem to offer the explanation. If the bacteria from an appendicitis brought to the liver by the portal blood were destroyed by the liver, no bile-passage infection would occur from this source; but if the liver, owing to its inefficiency, or on account of the number and virulence of the bacteria brought to it, could not destroy them, but turned them into the bile stream, perhaps with their degree of virulence diminished, bile-passage inflammation might occur. Mechanical conditions favoring the stagnation of bile would also influence the occurrence of bile-passage infection under such circumstances. Acute appendicitis is less likely to cause disease of the biliary apparatus because the patient is apt to die or the appendicitis to be terminated by operation. Furthermore, as stated in the foregoing, it is not the acute and virulent inflammation, but long-standing and mild catarrh of the bile passages that predisposes to stone formation. Chronic appendicitis is a common affection, and by chronic appendicitis it is not necessarily meant that peri-appendicular changes must be present or acute attacks complained of. A chronic inflammation in an appendix with an apparently normal peritoneal covering may be sufficiently severe to be recognized as a definite disease and may produce symptoms sufficiently annoying to warrant removal of the appendix. Deaver's dictum, "The expression, chronic appendicitis, has but little meaning," can no longer be accepted.

It was shown several years ago by Stengel and others that in cases of appendicitis in which the peritoneum of the appendix is normal, bacteria are found in all of the structures of the appendix except its peritoneal covering. It would seem from these observations that in chronic appendicitis bacteria could find their way into the radicals of the portal vein. The anatomy of the appendix is not unfavorable to portal blood infection. The presence of the abundant plexus of veins beneath the epithelium lining of the appendix and the abundant anastomosis between the portal vein radicals that drain the appendix afford all that is necessary for an endo-appendicitis to produce infection of the portal blood. It has been shown that the occurrence of thrombosis is not necessary for germs to pass from the appendix to the liver by way of the portal system. It is probable that the lymphatics do not transmit bacteria from the appendix to the bile passages. Loison makes the statement that the lymphatics of the appendix do not communicate with the liver in any way.

Although it is readily appreciable that the foregoing does not show that appendicitis is or is not definitely associated with bile-passage infections, and while it may be impossible to prove that appendicitis does or does not cause these diseases, it is probable, theoretically and clinically, that appendicitis may at times be the underlying cause of infections of the bile passages and, of course, of one of the manifestations of these diseases—gallstones.

PRACTICAL CONCLUSIONS.

Regardless of the absence of proof of the existence of a definite relationship between appendicitis and infections of the bile passages, disease of the appendix should be kept in mind in performing every gallstone operation. The appendix should be inspected when possible and should by no means be considered normal on account of the absence of peri-appendicular changes. Unless my experience, with the limited number of cases mentioned in this article, has been exceptional, those who operate for the removal of gallstones and, as a rule, remove the appendix in doing these operations will be impressed with the frequency of the coexistence of these diseases, and if the combined operation is more frequently performed the results of surgery for the relief of bile-passage diseases will be more satisfactory.

405 Altman Building.

INFLUENCE OF INTRAPERITONEAL INJECTION OF WARM STERILE NORMAL SALINE SOLUTION IN INTRAPERITONEAL HEMORRHAGE.*

MARK JAMPOLIS, A.M., M.D.

Assistant in Department of Physiology, Northwestern University Medical School.

CHICAGO.

I. HISTORY.

That all cases of intraperitoneal hemorrhage can be positively diagnosticated within a few minutes, in a safe and simple manner, and just as effectively as by an exploratory operation, has been demonstrated by H. S. Hollenbeck.

Working under the direction of Professor Hall in the Department of Physiology of the Northwestern University Medical School, in a series of experiments on dogs, Hollenbeck produced intra-abdominal hemorrhage by various methods, and with a specially constructed trocar determined its presence within two or three minutes, without injury to the intestine or its peritoneal covering. The trocar was passed carefully into the peritoneal cavity, the perforator was withdrawn and a hypodermic syringe was attached to the canula. When the blood was in a fluid condition it was easily aspirated and the diagnosis made, but when clotted a preliminary injection of water was necessary. In the presence of hemorrhage the water become blood tinged, while in the absence of hemorrhage the water remained clear.

Of late years the subject of normal saline injections in cases of hemorrhage and shock has been enthusiastically studied and discussed. That they are of the greatest value is now universally admitted. As a rule the solution is injected either directly into a vein, into the rectum, or subcutaneously into the lymph spaces, especially under the mammary gland. But the peritoneum, especially that covering the diaphragm, has great absorbing power. Allaway[1] reports a case of heart failure following removal of an abdominal tumor in which the injection of normal saline solution into the peritoneum was followed by immediate resuscitation. Hare[2] states that abdominal transfusions have been successfully performed and that such a procedure is a good one on account of the

* Read in the Section on Pathology and Physiology of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

1. Allaway: Mont. Med. Jour., 1891-92, vol. xx, p. 568.
2. "Text-Book on Therapeutics."

large absorbing surface exposed. Byron Robinson,[3] who has studied the peritoneum extensively, says: "With the recognized rapidity of peritoneal absorption, extensive and dangerous hemorrhage peritoneal injections might save life.

That shock and the depleted circulatory system can be effectually treated by intraperitoneal infusions must be admitted. But the local effect on the peritoneum must be considered as well. With the peritoneal cavity filled with blood, fluid or coagulated, would the effect on the conditions in the cavity be beneficial or detrimental? To determine this question it was decided that not only must the literature be consulted, but experiments performed. Should the procedure prove to be a valuable one in every way, normal saline solution could be easily infused through the diagnostic canula, and in fact, the diagnosis and the treatment, whether curative or merely palliative before a laparotomy, would be embraced by one simple operation.

In 1876 George Wegner[4] showed by animal experiments that the peritoneum absorbs gases, liquids and solids; that gall, muscle infusion, urine, blood and salt solution are absorbed without causing peritonitis and, furthermore, that all of the constituents of blood are absorbed in time without encapsulation. It is surprising that most of the experiments with blood in the peritoneal cavity have been performed with defibrinated blood. The absorption of defibrinated blood is of little clinical significance, but the results obtained by different investigators are interesting. Orlow[5] injected 300 c.c. into the peritoneal cavity; after five hours the amount was unchanged, but after twenty-four hours 160 c.c. were absorbed. Cordua, cited by Robinson,[3] working under Ponfick, found widely different phenomena. After three days half of the defibrinated blood remained, five days elapsing before all was absorbed.

The cause and path of the absorption of peritoneal fluids has been studied extensively by Wegner,[4] Dybkowsky,[6] Southgate,[7] Adler and Meltzer,[8] Orlow,[9] Starling and Tubby,[10] Heidenhain[11] and others, but the subject is as yet unsettled. The fact that absorption occurs even after death, or after the introduction of deadly and irritating solutions, disproves the theory of "vital force." That the stomata play an important rôle was demonstrated experimentally by Ludwig.[6] It is most generally accepted that the process is for the most part due to mechanical and physical forces. Wagner[4] demonstrated that any increase in the intra-abdominal pressure hastens absorption, or in other words, the more fluid the peritoneal cavity contains, the more rapidly is the solution absorbed. Warm saline solution was injected into two rabbits; into one 200 c.c. and into the other 100 c.c. After one hour 134 c.c. were absorbed in the first, and only 50 c.c. in the second. Similarly saline solution was injected into two dogs; into one 870 c.c. and into the other 500 c.c. In the first, after one hour 170 c.c. were absorbed and in the other, after two hours only 100 c.c. Filtration, associated with increased intra-abdominal pressure must therefore be an important factor. Nevertheless, filtration is active only to a certain extent, for in the event of enormous accumulation of fluid in the abdominal cavity, as in ascites, absorption is completely arrested. That osmosis performs an important part must also be admitted,[12] for all agree that intraperitoneal fluids disappear in inverse ratio to their osmotic pressure, or in other words, the lesser the concentration of the fluid in the peritoneal cavity the more rapid is the absorption. Consequently, the addition of normal salt solution, by increasing the intra-abdominal pressure would favor absorption by filtration and, by decreasing the concentration of the peritoneal contents, would favor absorption by osmosis.

Whether absorption takes place by way of the blood vessels directly or indirectly through the lymphatics has little bearing on our subject and suffice it to say that after extensive labor Heidenhain,[11] Starling,[10] Wegner,[4] and others are unable to agree.

A few words are necessary regarding cases of intraperitoneal hemorrhage associated with a possibility of infection. Penetrating wounds of the abdominal wall, such as are caused by bullets and knives, usually prognosticate septic peritonitis. Rupture of a hollow viscus following a non-penetrating injury may also complicate the hemorrhage with infection. But the aspiration of urine, bile or fluid feces from the peritoneal cavity with the diagnostic canula would positively demonstrate the condition to the physician. Many surgeons advocate and practice peritoneal irrigation in septic peritonitis, while on the other hand, as many others are positively opposed to the practice. The arguments advanced by both factions are well known and need not be repeated at this time. It is not my intention to speak for or against normal saline injections into the peritoneal cavity in case of hemorrhage associated with infection, but to confine myself strictly to those cases which are due to trauma not producing infection and after animal experimentation to summarize and draw conclusions relative to the practical value of the procedure at such times.

II. METHODS.

Experiments were performed on fifteen dogs, strict surgical asepsis being practiced in each case. The dog was anesthetized with chloroform, a median incision made, a loop of intestine withdrawn and a branch of the mesenteric vessels, both artery and vein, selected in such a place as to allow free circulation to the intestine without this branch. Ligatures were placed around the vessels in two places and between them the vessels cut. After permitting the vessels to bleed into the peritoneal cavity for a certain length of time, varying in the different experiments, the intestines were replaced. To procure profuse bleeding it was necessary to treat two or more branches in the same manner. In seven of the experiments, the wound was sutured immediately, while in the other eight warm sterile normal sodium chlorid solution (0.6 per cent.), the amount varying in individual cases, was first infused. Exploratory operations were performed under anesthesia on subsequent days to ascertain the presence or absence of clots and adhesions, the condition of the peritoneum and the character and approximate quantity of blood and fluid in the peritoneal cavity. At the same time the rectal temperature was

3. Robinson, Byron: "The Anatomy and Physiology of the Peritoneum." A most extensive bibliography is found in this book.
4. Wegner, George: Arch. f. klin. Chir., 1876, vol. xx.
5. Orlow, W. N.: Arch. f. d. gs. Physiol., Bonn, 1894, vol. lix, pp. 170-200.
6. Dybkowsky: Ludwig's "Arbeiten," 1866.
7. Southgate: Centbl. f. Physiol., Leipsic and Vienna, 1894, vol. viii, p. 449.
8. Adler and Meltzer: Jour. of Exp. Med., July, 1896.
9. Orlow, W. N.: Pflüger's Arch., vol. lix, 1895.
10. Starling and Tubby: Jour. of Physiol., 1894, vol. xvi, p. 140.
11. Heidenhain: Pflüger's Arch., vol. lix, 1895.
12. Leaths, J. B., and Starling, E. H.: Jour. of Physiol., 1895, vol. xviii, p. 106.

taken and general observations as to the dog's condition were recorded. On completion of each experiment the dog was dispatched with chloroform.

III. EXPERIMENTAL CASES.

CASE 1.—Dog; temperature, 100.2 F.; pulse regular; general condition good. About 2 ounces of blood were allowed to flow and normal salt solution was poured in from a flask until the cavity was nearly full.

Second Day.—Temperature, 101; pulse regular; general condition good. Peritoneum was normal and the cavity was approximately two-thirds full of bloody serum. No coagula were present.

Third Day.—Temperature, 101.2; pulse regular; general condition good. Peritoneum was normal and the cavity approximately one-third full of serum, only slightly blood tinged. No coagula were present.

CASE 2.—Male dog; temperature, 99.8; pulse regular; general condition good. About 2 ounces of blood were allowed to flow as before, but no salt solution was introduced.

Second Day.—Dog was weak; temperature, 103; pulse fast and feeble; respiration fast and choking. Peritoneum appeared normal and the cavity contained a small amount of bloody serum and a few clots in the omentum.

Third Day.—Dog was found dead. Peritoneum appeared dull, and a few adhesions were present between the intestinal loops. Peritoneal cavity contained small amount of clear fluid and a few clots in the omentum.

CASE 3.—Male dog; temperature, 100; pulse regular; general condition good. About 2 ounces of blood were allowed to flow and salt solution was added until the cavity was full.

Second Day.—General condition was good; temperature, 100; pulse regular.

Third Day.—Dog was rather weak; temperature, 101.8; pulse regular. Peritoneum was normal, and the cavity was about one-third full of fluid, slightly blood tinged. No clots were present.

CASE 4.—Female dog; temperature, 101; pulse regular; general condition good. About 3 ounces of blood were allowed to flow, and no salt solution was introduced.

Second Day.—General condition was fair; temperature, 101.5; pulse regular. Peritoneum normal. Intestinal coils were bathed in a large amount of the bloody serum. No clots were present.

Fourth Day.—Dog was very weak; temperature, 103.8; pulse feeble. Peritoneum normal. Light peritoneal adhesions between intestinal loops, due to small organizing blood clots, were found. A small amount of blood-tinged serum was present.

CASE 5.—Female dog; temperature, 102.2; pulse regular; general condition good. About 4 ounces of blood were allowed to flow and no salt solution was introduced.

Second Day.—Dog was in good condition; temperature, 102.2; pulse regular. Peritoneum was normal and cavity contained a small amount of bloody serum. No clots or adhesions were present.

Third Day.—Dog was weak; temperature, 103.5. Peritoneum was normal and cavity contained only a small amount of serum, slightly blood stained. No clots or adhesions were present.

CASE 6.—Female dog; temperature, 99.4; lively and in good condition. About 3 ounces of blood were allowed to flow and salt solution was added until the peritoneal cavity was full.

Third Day.—Dog was in good condition. Peritoneum was normal and cavity was about one-third full of blood-tinged serum. No clots were present.

Fourth Day.—General condition was good; temperature, 101.6; pulse regular. Peritoneum was normal and cavity contained only a small amount of clear serum. No clots or adhesions were present.

CASE 7.—Male dog; temperature, 101.4; pulse regular; general condition good. Blood was allowed to flow until about 5 ounces were introduced. Normal salt solution was added until the abdomen was full.

Second Day.—General condition was good. Peritoneum was normal and cavity was about one-half full of blood-tinged serum. No coagula or adhesions were present.

Third Day.—General condition was good; temperature, 102; pulse regular. Peritoneum was normal and cavity about one-fourth full of slightly blood-tinged serum. No clots or adhesions were present.

CASE 8.—Female dog; temperature, 99.3; pulse regular; general condition fair. Blood was allowed to flow until peritoneal cavity contained about 5 ounces. No salt solution was introduced.

Third Day.—General condition was poor; temperature, 102.6; pulse regular. Peritoneum was normal and cavity contained about 2 ounces of bloody serum. A large clot formed on the mesenteric side of the intestine near the vessels, causing a kink in the intestines. No adhesions between intestinal loop were present.

CASE 9.—Male dog; temperature, 101.3; pulse regular; general condition fair. Blood was allowed to flow until the cavity was nearly full, containing 7 to 8 ounces. No salt solution was introduced.

Second Day.—Dog was weak; temperature, 103; pulse fast.

Fourth Day.—Dog was very weak; temperature, 102.2; pulse regular. Peritoneal cavity contained a small amount of bloody serum. Peritoneum was normal, but large coagula formed between the intestinal loops causing adhesions, which were about to organize and become fibrous.

CASE 10.—Female dog; temperature, 100.1; pulse regular; general condition good. Blood was allowed to flow until the cavity was nearly full, containing 7 to 8 ounces, and no salt solution was added.

Second Day.—General condition was good; temperature, 101.2; pulse regular. Peritoneal cavity contained a large amount of bloody serum and a small clot around the ligated artery.

Fourth Day.—General condition was poor; temperature, 103.4; pulse feeble and fast. Peritoneum was normal, and cavity still contained about 2 ounces of bloody serum. The clot was larger and the intestine kinked by its beginning contraction.

CASE 11.—Female dog; temperature, 102.1; pulse regular; general condition fair. Blood was allowed to flow until the cavity was full, containing 7 to 8 ounces. No salt solution was introduced.

Second Day.—General condition was poor; temperature, 101.8; pulse fast but regular.

Fourth Day.—Dog was so weak she could scarcely walk; temperature, 103.8; pulse weak. Peritoneum was normal and cavity contained a small amount of bloody serum. Large clots in three places caused beginning intestinal adhesions.

CASE 12.—Female dog; temperature, 100.8; pulse regular; general condition good. Blood was allowed to flow until the peritoneal cavity was nearly full, containing about 7 or 8 ounces. Salt solution was added until the cavity would hold no more.

Second Day.—Temperature was 101.6; dog in good condition.

Fourth Day.—Temperature, 101.4; dog in good condition. Peritoneum was normal and the cavity contained a small amount of slightly blood-tinged serum. No clots or adhesions were present.

CASE 13.—Male dog; temperature, 101.6; pulse regular, but feeble; dog in only fair condition. Blood was allowed to flow until the cavity was full, and the wound was sewed up. The dog became weak and nearly died on the table. The trocar was employed, and about 3 ounces of blood were withdrawn through the canula by a hypodermic syringe attached to the canula. About 3 ounces of warm normal saline solution were then injected. The dog speedily recovered from the anesthetic.

Second Day.—Dog was in poor condition; temperature, 102.2; pulse irregular and weak.

Fourth Day.—Temperature, 102.8; dog was still weak, worse than on first day. Peritoneum was normal and cavity contained a small amount of clear fluid. No coagula or adhesions were present.

CASE 14.—Female dog; temperature, 101.2; pulse regular. Dog was normal but vicious. Blood was allowed to flow until the cavity was nearly filled. About 3 ounces of salt solution were poured into the cavity.

Second Day.—General Condition was good; temperature, 102.2.

Fourth Day.—Dog was in good condition, but vicious. Peritoneum was normal, and the cavity contained a small amount of clear serum. No clots or adhesions were present.

CASE 15.—Female dog; temperature, 101.8; pulse regular; general condition good. The dog was treated as in Case 14.

Second Day.—General condition was good; temperature, 101.8; pulse regular.

Fourth Day.—General condition was good; temperature, 102.4; pulse regular. Peritoneum was normal and the cavity contained a small amount of clear serum. A small clot was found in the omentum, but no clots or adhesions were present around the intestines.

SUMMARY.

Case Number.	Sex.	Temperature Before Operation.	Approximate Amount of Hemorrhage.	Approximate Amount of Saline Solution Injected.	Temperature Subsequent to Operation.			Remarks.			
					Second Day.	Third Day.	Fourth Day.	General Condition.	Peritoneal Contents.		Peritoneum.
									Fluids.	Clots and Adhesions.	
1	. .	100.2	2 oz.	8 oz	101	101.2	. . . .	Good throughout.	On third day, about 3 oz. of blood-tinged serum.	None	Normal.
3	M.	100	2 oz.	8 oz.	100	101.8	. . . .	Weak on third day.	On third day, about 3 oz. of blood-tinged serum.	None	Normal.
6	F.	99.4	3 oz.	7 oz.	. . . .	. . . .	101.6	Good throughout.	On fourth day, small am't of clear serum.	None	Normal.
7	M.	101.4	5 oz.	5 oz.	. . . .	102	. . . .	Good throughout.	On third day, small am't of blood tinged serum.	None	Normal.
12	F.	100.8	7 to 8 oz.	3 oz.	101.6	. . . .	101.4	Good throughout.	On fourth day, small am't of slightly blood-tinged serum.	None	Normal.
13	M.	101.	7 to 8 oz.	3 oz. through canula.	102.2	. . . .	102.8	Progressi'ly weaker; nearly died during operati'n	On fourth day, small am't of clear serum.	None	Normal.
14	F.	101.2	7 to 8 oz.	8 oz.	102.2	. . . .	. . . .	Good, but very vicious.	On fourth day, small am't of clear serum.	None	Normal.
15	F.	101.8	7 to 8 oz.	3 oz.	101.8	. . . .	102.4	Good throughout.	On fourth day, small am't of clear serum.	Small clot in omentum. No clots or adhesions among intestines.	Normal.
2	M.	99.8	2 oz.	None.	103	Dead...	. . . .	Good at start. Poor on second. Dead on third.	On second day small am't of blood-tinged serum.	Clot in omentum on second day. Intestinal adhesions after death.	Peritonitis.
4	F.	101	3 oz.	None.	101.5	. . . .	103.8	Good at start. Poor on fourth.	On fourth day, small am't of blood-tinged serum.	On fourth day, small clots causing light peritoneal adhesions.	Normal.
5	F.	102.2	4 oz.	None.	102.2	. . .	103.5	Progressively poorer.	On third day, small am't of serum, slightly blood-tinged.	None	Normal.
8	F.	99.3	5 oz.	None	. . . .	102.6	. . . .	Fair at start, but progressively poorer.	On third day, about 2 oz. of bloody serum.	Large clot, causing kink in the intestine, but no adhesions to other parts of intestine.	Normal.
9	M.	101.3	7 to 8 oz.	None.	103	. . . .	102.2	Progressively worse.	On fourth day, small am't of serum, very blood-tinged.	Large clots causing intestinal adhesions on fourth day.	Normal.
10	F.	100.1	7 to 8 oz.	None.	101.2	. . . .	103.4	Good at start. Poor fourth day.	On fourth day, about 2 oz. of bloody serum.	On fourth day, clot kinking intestine. No clots or adhesions.	Normal.
11	F.	102.1	7 to 8 oz.	None.	101.8	. . . .	103.8	Fair at start. Became extremely weak.	On fourth day, small am't of bloody serum.	On fourth day, three large clots, causing intestinal adhesions.	Normal.

DISCUSSION.

1. Of the fifteen dogs, eight received infusions.

2. Of these eight dogs, six were in good condition throughout the experiment, the other two becoming progressively weaker. In only four of these dogs was the temperature over 102,* the highest record being 102.8. A glance at the table shows that temperature occurred only in those infused dogs which were bled most profusely.[1]

3. All the dogs which were not injected grew progressively weaker after operation, one dying before the third day, probably of peritonitis. In all of the non-infused dogs fever was present at some time, in only one below 103 degrees.

4. No peritoneal adhesions were present in any of the eight dogs that received saline infusions; a small clot was found in the omentum of one which was profusely bled.

5. In six of the seven which were not infused organizing clots were formed destined to become fibrous adhesions. They were most marked in the three that were profusely bled and in these subjects would ultimately have resulted in intestinal strangulation.

6. The blood was absorbed more rapidly in those dogs that received infusions. In four out of five of the injected dogs that were kept until the fourth day, nothing remained but a small amount of clear serum, the serum being slightly blood-tinged in the fifth.

7. In the four non-injected dogs which were kept until the fourth day, the serum which remained was bloody or blood-tinged in each case.

8. The most marked advantages of saline infusion were found in those cases which were bled profusely.

* The average rectal temperature of dogs is 101.5 F.

IV. CONCLUSIONS.

1. The infusion of normal saline into the peritoneal cavity should be practiced in every case of hemorrhage not associated with infection, for two general reasons: 1. Its effect on shock. 2. Its beneficial action on the peritoneum and the conditions in the peritoneal cavity. In some cases the procedure would prove palliative, in others curative.

2. In cases of intraperitoneal hemorrhage accompanied by shock so severe that an immediate laparotomy would inevitably prove fatal, the infusion at once of warm sterile normal saline solution into the peritoneal cavity would certainly do no harm, but on the other hand would stimulate the peritoneum and at the same time tend to counteract the existing shock and prepare the system for any which might follow a subsequent laparotomy.

3. In cases in which hemorrhage might cease and a laparotomy be not needed, the procedure would be of the greatest value. Apart from combating shock, the solution would mingle intimately with the blood, hold the particles in suspension and hasten absorption of the fluids in the peritoneal cavity without allowing coagula to form, to be the foundation of troublesome and perhaps fatal adhesions and strangulations.

4. The procedure would not require great skill, but would be feasible in the hands of any general practitioner. The following is offered as a suggestion: The solution should be kept sterile in a flask, fitted in a portable case, which could also contain a compartment for a small bottle of alcohol, in which to keep the trocar sterile and ready for use, and another to accommodate a long sterile rubber tube to serve as a connection between the flask and canula. Then in case of emergency the solution could be quickly raised to the required temperature, a small area of skin sterilized, the trocar introduced and the diagnosis made, the flask and canula connected and, by raising and lowering the flask, the flow could be regulated and the amount noted. After a gentle flushing of the peritoneal cavity, 500 c.c. to 1,000 c.c. might be kept within and the patient sent to the hospital, the better prepared for later developments.

DISCUSSION.

DR. WINFIELD S. HALL, Chicago, in reply to questions, said that no leucocyte count was taken during these experiments. The hemorrhages were produced thus: A small incision was made and one of the branches of the mesentery artery cut through this incision and allowed to bleed until the intravisceral spaces were partly or wholly filled, and then the wound was closed. There is no way of determining the exact amount of hemorrhage without drawing it off in some vessel and then putting it back. Dr. Hall said that it was not thought desirable to depart so far from what would be found in ordinary cases. Some observers have withdrawn blood and defibrinated it.

DR. S. J. MELTZER said that he believed that if the bleeding comes from a small artery the best plan is to leave it alone, since the contraction of the vessel wall in conjunction with the clotting will soon stop the bleeding, aided especially by the intra-abdominal pressure. Bleeding from large vessels can be stopped only by ligature after laparotomy has been made. If, however, the bleeding comes from the parenchyma of a ruptured organ, a transfusion of saline can do only harm, since it would tend to increase the blood pressure and with it the bleeding. Transfusion can be useful only after the bleeding has stopped, to supplant the lost blood, but can hardly be employed for the purpose of stopping the bleeding.

DR. V. C. VAUGHAN, Ann Arbor, Mich., said it is the consensus of opinion that it is bad to inject salt solution or anything else when there is a possibility of infection. The abdominal cavity is divided into departments. If solution is used it carries the infection. For this reason surgeons are giving up the washing out of the cavity. It spreads the infection and carries it to every part of the intestine and makes the surface on which the germs grow much larger. Those who do not wash out the cavity certainly have the best of the argument.

DR. WINFIELD S. HALL, Chicago, said that an artery was chosen for the experiments because of difficulty in controlling the hemorrhage while getting the amount of blood wanted from the spleen or liver. There were fifteen dogs: eight had saline solution and seven did not. Those that did not have the saline solution had a considerable rise in temperature. In the case of the dogs that had it there was no evidence of temperature. The wounds were opened up to see the progress of recovery. In several cases in which no saline solution was used clots formed which made it very evident that the course of recovery would yield to adhesion that might cause strangulation. In no case in which saline solution was introduced was anything of that kind shown. So far as appearance goes, the experiments left no doubt but that saline solution was of great value. As Professor Vaughan pointed out when there was a rupture of the intestine with danger of spreading the infection, this would be bad procedure.

DR. S. J. MELTZER, New York, asked what was the cause of the difference when no saline solution was used.

DR. WINFIELD S. HALL said that there was one case in which asepsis had miscarried and in that case there was some temperature. In other cases he could account for the increase of temperature only as due to the action of the peritoneum. There was no infection. It may have been due to absorption of the clot. He usually associates it with infection, but there did not seem to be any infection.

OBSERVATIONS ON THE FUNCTIONS OF THE ASSOCIATION AREAS (CEREBRUM) IN MONKEYS.*

SHEPHERD IVORY FRANZ, PH.D.
Pathological Pathologist, McLean Hospital.
WAVERLEY, MASS.

Our knowledge of the functions of the cerebrum has been obtained from studies of the effects of stimulation and destruction of the various parts of the organ. In this study both physiologists and clinicians have been engaged. Physiologists have spent most time in determining the effects of lesions, experimentally produced, and the motor accompaniments of stimuli of different kinds. The clinicians, including surgeons, neurologists and pathologists, have been able to observe in man the effects of destructions from accidents, disturbances of functions from emboli, thrombi and hemorrhages, and in some cases it has been found practicable to stimulate the cerebral cortex in man after the fashion of the physiologic experiments and thus to map out the muscular reactions represented in the cortex.

PHYSIOLOGIC AND CLINICAL METHODS.

Both the physiologic and the clinical methods have advantages and disadvantages. On animals the physiologist is enabled to limit the lesion, to repeat his experiments often and to make detailed observations on individual points, to use any or all the apparatus of a laboratory and to observe his "patients" before and after an experimental accident. The clinician, who is dependent on "Nature's experiments," is limited in some of these directions, but on the other hand he has a great advantage in that he deals with men. From the responses of a patient one can learn more of his feelings, of his sensations and of his other mental states than is possible with animals, and the lack or disturbances of speech ability which are found in some individuals are of more value for the understanding of certain cortical functions than hundreds of experiments on dogs or cats or monkeys. The two methods, it is well understood, supplement each other, and the student of brain functions must consider and weigh the results of both.

Both methods have been most successful in the determination of the motor and of the sensory functions of the cerebrum. The physiologists have been unable to advance our knowledge of the workings of the so-called association areas represented by over one-half of the

---

* Read in the Section on Pathology and Physiology of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

*The present paper is in the nature of a preliminary communication. A full account of the experiments which were made will be published soon. The work on monkeys was made possible by a grant from the Carnegie Institution of Washington to the author.

cerebral cortex. These portions of the brain do not produce a motor response on stimulation, and the effects of destructions or extirpations are not worked out. On the other hand, in only one particular have the clinicians been able to demonstrate clearly the functions of any of these parts, viz., in the localization of the functions of speech. The relative importance of the frontal or the parieto-occipital association areas in mental states has been often considered and the conclusions have been totally different. The more recent attempts have been to locate "mind," or the "higher intellectual faculties" in the frontal region, more especially in the prefrontal lobes.

In this country Phelps[1] and Mills[2] have championed the cause of the frontal lobes, particularly the left, as the seat of "thought." This has been done, it seems to me, without a sufficient analysis of the mental symptoms associated with cerebral injuries and without careful studies of the brains of individuals with high and low mental development. On this latter point it may be mentioned that the brains of Gauss and Helmholtz, which have been considered by Mills to indicate the predominant importance of the frontal lobes in intellectual states, are described by Clapham[3] as examples of great complexity of convolution in the zone between the Rolandic and the visual areas. Clapham, consequently, considers this region to be particularly associated with high mental development. The cases cited by Mills and those given in Schuster's admirable book,[4] which bear on the subject of the functions of the associational areas, I shall consider in detail in another article.

PHELPS' WORK.

There is time now to take up only very briefly some of Phelps' cases and conclusions. This I shall do in support of my previous statement that the conclusions regarding the functions of the frontal lobes have been drawn without a sufficiently careful analysis of the mental conditions in the cases of cerebral injury. "Loss of consciousness, the event of stupor or the access of delirium have been found to be dependent on the nature of the lesion, apparently uninfluenced by its situation," is a general justifiable deduction made by Phelps from all his cases.[5] From the results of his frontal-lobe cases the following conclusions are drawn:[6]

1. Mental decadence always attends conjoint lesions of both prefrontal regions. 2. Mental decadence always attends lesion of the left prefrontal region alone. 3. Mental decadence never attends lesion of the right prefrontal region alone.

The cases of frontal laceration cited in his book and the sixteen cases in his article do not admit such broad inferences. Of the eleven cases of laceration of the left frontal lobe only Cases 6 and 9 were undoubtedly conscious and without stupor or delirium, but with a mental change. Ten cases of laceration of both frontals (pp. 130-131) include four patients in whom the mental condition was 'normal" on days following the injury, and Case 300 (p. 580) is probably an example of mental impairment with lesion of the right frontal lobe. It is unfortunate that all of the individuals with lesions in the left frontal alone, or in both frontals, whose cases are given in Phelps' recent article, died soon after the accidents. We can see, however, that not all individuals had their mental faculties located in the left frontal lobe. The patient in Case 2 with a left frontal lesion comprehended up to the morning of his death. The patient in Case 3, although there was a certain amount of stupor and fever coincident with the left frontal injury, could be roused sufficiently to answer questions, and when the fever had only partially subsided the "comprehension was less delayed." In Case B, a fall on the right side, the patient showed a mental defect for at least two weeks. In Case C patient was discharged on the twenty-second day with delusion persisting after injury to the right side of the head. In Case D, a fracture on the left side, patient was entirely rational at the end of the fourth week. I am well aware that the cerebral lesions in the last three cases were not determined, but we are as certain that the brain injury in Cases B and C was on the right side as that it was on the left in Case D.

From a psychologic standpoint, what is lacking in all the accounts is a careful analysis of the mental condition. Apathetic, dull, stolid, irritable, restless, nervous, deficient memory, slow comprehension, are general terms for conditions which, for scientific purposes and in the present stage of psychology, the observer could and should try to describe more carefully. Any one of these terms may be descriptive of states of deficient or wandering attention, some are indicative of a mild degree of delirium. It is of prime importance that every case should be examined from a psychologic standpoint, if psychologic inferences are to be drawn.

A similar criticism must be made regarding the conclusions of most physiologists in regard to the functions of the association areas. The observations which they have made are even more "casual" than the clinical ones. Loeb[7] says that it is "impossible to notice the slightest difference in the mental functions of the dog" if both frontal lobes are removed, although he does note that if the anterior halves of both hemispheres be removed an animal becomes "idiotic." Such a careful observer as Schäfer[8] uses the term "semi-idiocy" to describe the mental condition in monkeys following the removal of the temporal lobes. Idiocy in children is difficult to diagnose from simple observation and the term "semi-idiocy" has no meaning in psychologic practice.

For the reason that the description of results of previous physiologic work on the association areas was lacking in exactness and definiteness, about six years ago I devised a method to determine more accurately the functions of these parts in animals. The mental life of animals, and even of man, is made up very largely of series of association, which in general terms are of a simple sensory-motor character.[9] Any definite sensory-motor association may be produced in an animal in a very few days, and it is possible to discover whether or not the association persists after removal of parts of the cerebrum.

AUTHOR'S EXPERIMENTS ON CATS.

The results of an investigation of this character, viz., on the relation of the frontal lobes to the production and retention of simple sensory-motor habits in cats, have

1. "Traumatic Injuries of the Brain," second edition, 1900; also articles in the New York Med. Jour., 1894-5, and Jour. Med. Sci., 1902, 1906.
2. Mills and Weisenburg: "Localization of the Higher Psychic Functions," THE JOURNAL A. M. A., 1906, vol. xlvi, p. 337.
3. Jour. Ment. Sci., 1898, vol. xliv, p. 290.
4. "Psychische Störungen bei Hirntumoren," 1902.
5. "Traumatic Injuries to the Brain," p. 127.
6. Am. Jour. Med. Sci., vol. cxxxi, p. 457.
7. "Comparative Physiology of the Brain," p. 275.
8. "Text-book of Physiology."
9. For an account of animal psychology and the mental life of animals the reader is referred to the works of Thorndike, Lloyd Morgan and Hobhouse.

already been published.[10] In that article the method is described in full. I may paraphrase briefly:

An animal is placed in a certain environment, usually unpleasant or indifferent to the animal. By a simple motor adjustment the cat or the dog or the monkey gets a subsequent pleasure (for example, some food). At first the motor response is neither accurate nor speedy, but soon the animal learns—i. e., forms the association of a definite movement or set of movements with a given situation. When the association or habit is "set," it is possible to discover that portions of the cerebrum are concerned in its production or retention by the extirpation of definite regions and the determination of the presence or absence of the association. If, after the destruction of a part of an animal's brain, there is no alteration in its mental condition, the time for the production of a movement or set of movements, when the animal is placed in a situation calling for such motor response, should remain the same. It was found, however, that after a bilateral lesion in the frontal lobes certain habits were lost. This result, it was shown, could not be due to "shock," for other brain lesions were not followed by loss of such associations. Unilateral lesions in the frontal areas were followed by a slowing of the motor response.

AUTHOR'S EXPERIMENTS ON MONKEYS.

Some similar and some totally negative results from similar experiments have been obtained with monkeys by me since the publication of the experiments on cats. These I wish to report at this time. The simple associations which I produced in the monkeys are what may be called "food box" and "hurdles."

The Food-Box Experiment.—In the food-box experiment the animal was placed in a small cage, about eighteen inches cube, which was covered with wire netting and to which was attached at the back, in the upper right-hand corner, a smaller "food box" about seven inches cube. The door of the food box was fastened by an old-fashioned turn-button, which had to be turned through an angle of 90 degrees before the door of the box could be opened. A greater or less turn would keep the door of the box closed. The button of the food box was placed sufficiently high, so that the animal had to stand and reach for it. A hungry animal was placed in the small cage, food was put in the box and the animal attempted to get at the food. When the animal was first placed in the peculiar situation it made many random movements, trying to squeeze through the wire netting, shaking the door and putting its hands all over the box and the cage. In its random movements the button may be turned and the door of the box come open. The animal sees the food, takes it and eats. After a very few trials the attention of the animal is almost exclusively centered on the food box and its door, and so soon as the food is placed in a box it will immediately turn the button. The association has been formed. This association will persist for a long period, two to three months, without materially altering the average time for the performance of the complex act.

The Hurdle Experiment.—The "hurdle" gave a situation a little more complicated. The animal was placed on a box ten inches high, from which it jumped or walked to a bar fifteen inches high, thence to another bar ten inches high, through a hole six inches in diameter, in a box six inches deep, then up and down two short ladders placed together, and finally it lifted the lid of the middle one of three boxes in which it found some food. The "hurdle" or obstacle race is much simpler than the description would indicate; its complexity is rather at the end in the choice of the proper (i. e., the center) box for food.

When an animal had learned the "hurdle" or "food box," of both, it was put aside for a week or ten days, with no practice, and then its memory was tested. A few extra trials to get the habit well learned were given and then the frontal lobes were cut away from the rest of the cerebrum. The surgical procedure was the same as I had previously used with cats.[11] Nine monkeys learned one or both of the associations and survived the operation for a sufficient length of time to have their memories tested. Some lived over nine months. Seven of the animals were of the macacque family, two were ringtails.

RESULTS.

The final results of the experiments I may group in three general divisions:

A. This class consists of two monkeys; both lost their newly-formed habits after the removal of the frontal lobes. The tests of retentiveness in these cases were made, respectively, about 24 and 40 hours after the operations. The results were very decided. Neither of the animals moved toward the door of the food box, but made random movements about the cage. One of the animals was restless, the other was stolid and indifferent. Each lived only a very few days (three and five, respectively). The autopsies showed that the frontal portions had been cut away from the rest of the cerebrum, but there was in one case an increase in intracranial pressure which was evidenced by a bulging of the brain substance when the bandage and trephine buttons were taken off. The results in these cases are in themselves of little value for the drawing of conclusions, it seems to me, because the animals survived the brain lesions for only a short time. It should be remarked, however, that the interval between the operation and death in both cases is as long as between accident and death in man in many cases which the clinicians report and which are highly rated.

B. The second class consists of three animals, a rhesus monkey and two ringtails, who lost their newly-formed associations after the removal of the frontals. All these animals lived a sufficiently long time to determine that the loss of habits was not due to the primary shock effects of the operation on the brain, but was a loss of the sensory-motor associations. The rhesus monkey died from hemorrhages subsequent to a second operation three months after the first operation. During the interval between the first and second operations the animal seemed perfectly normal (with the exception that the "food-box" and "hurdle" habits were lost), and when with other animals in a large cage it was impossible to note any difference in its behavior. This animal in the months following the first operation relearned the "food-box" association and the second operation was performed to determine what portion of the brain was concerned in the production of the habit after the prefrontals were excised. In cats I found that it was possible to teach an animal a trick, to remove the prefrontals and find the habit lost; then to have the animal relearn the same trick and to have it lost after removal of more of the frontals; and in the same manner for a third time to have an association formed and to have it lost subsequent to a third operation. It is possible, therefore, to have a mental defect, but to have a recovery in animals within a very short time, by a proc-

10. Am. Jour. Physiology, 1902, vol. viii, p. 1.

11. Am. Jour. Physiology, 1902, vol. viii, p. 5.

ess of relearning. A similar recovery has been obtained in the event of disturbance, or even of destruction, of the speech centers in man.

The other two animals that showed a loss of associations after the removal of the frontals lived, respectively, six and two months. Both of these ringtails had learned to jump from a shelf to my shoulder when I snapped my fingers, and this habit was lost as well as the "hurdle" and "food-box." Subsequent to the operation both of these animals seemed less friendly, they chattered more and screamed and showed their teeth when another monkey or a person approached them. In other respects their behavior was normal.

C. In my article on the effects following lesions of the frontal lobes in cats[12] I pointed out that habits, i. e., associations, of long standing were not lost after destruction of the prefrontal regions. A similar result was found with four monkeys in the present research. The associations which were investigated were mainly those of the "food-box." The most important of these cases is that of a female rhesus, living at the present time, two months after the operation, which was practiced on the "food-box" for 27 days, 5 times a day, over a period of 234 days. This animal learned to open the door of the "food-box" in an average time of 1.1 sec. before the operation, and two days after the operation the average time of 10 experiments was found to be 1.8 sec. At the middle of the tests with this monkey a period of 160 days was left free from any practice on the "food-box," and after this long interval the memory for the performance of the appropriate movements was perfect; average time before interval, 3.8 sec.; average time after interval, 4.4 sec. In this monkey the motor response partook of the nature of a reflex, and it is possible that the cerebral cortex was no longer used for the sensory and motor association, but that the adjustment was made in the basal ganglia. Probably a similar process in man of the assumption by lower centers of activities which at first are carried on by the higher is to be found in the learning of games, etc.

A male rhesus who was practiced 18 days over a total period of 43 days showed, so far as the ability to perform his "tricks" was concerned, no effect after the removal of both frontals. Another animal, a macacque, was trained for 15 days, and after operation his ability measured by the average time to perform tricks was lessened. Before the destruction of the frontal lobes he averaged 1.8 sec. for opening the "food box;" after the operation and for a few days his time was greatly lengthened, e. g., on the second day it averaged 23 sec. The fourth monkey which did not lose its habits after the removal of the frontal lobes also showed a retardation. In this animal the slowing was, however, not so marked as in the previous case.

CONCLUSIONS.

Conclusions to be drawn from the experiments may be summed up as follows:

1. In monkeys, as well as in cats, the frontal lobes are normally employed in the formation of simple sensory associations.

2. When the frontal lobes are destroyed, recently formed habits are lost. It has been found possible, however, for the animal to form new associations or to relearn old tricks.

3. When the associations are firmly established, destruction of the frontals is not always followed by a loss. There are all degrees of "memory" for any such particular habit, from perfect to a very decided hesitancy and slowing.

4. In this latter event the cerebral path is probably shortened, and the nervous connection of the sensory and the motor elements of the association takes place through tracts at the brain stem. The association has, therefore, more of the character of a reflex.

In addition to their value in indicating the functions of part of the associational areas in monkeys the results, I think, have a suggestive import for workers on the pathology of the brain of man. The experiments show not only that there are mental changes coincident with disturbances of the frontal lobes, but that the mental change which is described is one that could not be determined by simple observational methods, and they suggest, furthermore, that, for the determination of corresponding changes in man, accurate psychologic or psychophysical methods should be employed. The clinical, as well as the physiologic, evidence points to a dependence of certain mental processes on the integrity of the frontal lobes, and I am much inclined to believe that the frontal or prefrontal areas are of great value in our mental life. I feel, however, that the reported clinical observations do not prove this and that there is great need for more careful psychologic examination and experiment in the hospitals. The weakness of the clinical work is that so much is claimed without an adequate analysis of the mental conditions of the patients.

Much more and better information could be gathered if the patients were tested along the lines which are followed in psychologic laboratories and psychiatric hospitals. In any scientific work there can not be too great accuracy either in methods or in results. This is particularly true when the subject of research is so elusive a thing as is "mind." Careful dissection, sectioning and the use of good microscopes are deemed necessary in other fields of medical work, and psychologic scalpels, microtomes and high power lenses are indispensable to one who would attempt to solve the problem of the relation of the brain to mental processes.

12. Am. Jour. Physiology, 1902, vol. viii, p. 22.

FURTHER OBSERVATIONS ON THE INFLUENCE OF ALCOHOL ON THE METABOLISM OF HEPATIC GLYCOGEN.*

WILLIAM SALANT, M.D.
NEW YORK CITY.

The present report gives the results of a further study of the possible influence of alcohol on the metabolism of glycogen in the liver. It has recently been shown that, to a certain extent, alcohol can replace the carbohydrates of our daily diet. Consequently it would seem *a priori* that it might indirectly be a glycogen former, by sparing the carbohydrate radical of the tissue proteins, which may serve as a source of glycogen. The results of Nebelthan's[1] investigations, indeed, lend some support to this view. He found considerable quantities of glycogen in the liver of the hens to which large amounts of alcohol were fed after they had been starved for six days. In one of his experiments he found as

* Read in the Section on Pathology and Physiology of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

* From the Department of Physiological Chemistry of Columbia University, at the College of Physicians and Surgeons, New York.

1. Nebelthan: Ztschr. f. Biol., 1891, vol. xxviii, p. 138.

much as 3.5 per cent. of glycogen in the liver after feeding 10 c.c. of 96 per cent. alcohol per kilo in twenty-four hours.

To test the hypothesis suggested, I carried out a number of experiments[2] on apparently normal rabbits kept on an exclusive diet of alcohol for from four to six days. Normal rabbits were used as controls. They fasted from four to six days and did not receive alcohol. During the period of fasting, water was given to them by means of a stomach tube. This precaution was taken in order to control the possible loss of glycogen due to occasional struggling of the rabbits during the administration of alcohol.

The results of a number of observations have shown that alcohol given in moderate quantities (10 c.c. of 30 per cent. alcohol per kilo of rabbit daily) does not cause the accumulation of glycogen in the liver. The results were likewise negative when a somewhat larger quantity of alcohol (15 c.c. of 60 per cent. alcohol per kilo of rabbit daily) was used.

Attention was then directed to the effect of alcohol on the hepatic glycogen after it has accumulated in the liver. This problem presented itself under two aspects: (A) Does alcohol, on account of its high calorific value, spare the glycogen of the liver and thus retard its disappearance; or (B) if it fails to do so, does alcohol behave like various other toxic substances in this regard and accelerate the disappearance of glycogen from the liver?

A. In order to answer the first question, rabbits were fed on carrots from three to four days when they contained approximately the maximum accumulation of hepatic glycogen. All food was then withheld from four to six days. Alcohol (10 c.c. of 30 per cent. alcohol per kilo daily) was given daily by mouth by means of a stomach tube during the period of experimentation.

The results of a number of experiments have shown that the glycogen content of the liver in some alcohol-fed rabbits (at the end of the period indicated) was very small; in others the liver contained only a trace of glycogen. Only in the liver of one alcohol rabbit was the amount of glycogen appreciable—.8 per cent. In two experiments with larger quantities of alcohol (12 c.c. and 15 c.c. of 60 per cent. alcohol per kilo given for four days), there was not even a trace of glycogen. The control rabbits, which fasted from four to six days and were given water in the way indicated, proved to be as poor in hepatic glycogen as the alcohol rabbits. The conclusion is, therefore, justified that 30 per cent. alcohol when given in the amounts stated does not spare the glycogen of the liver, while the two experiments with larger quantities of alcohol suggest that a more rapid transformation of glycogen has taken place.

That various poisons cause rapid disappearance of glycogen from the liver was shown by several investigators. Thus Drummond and Paton[3] have shown that in acute adrenalin poisoning in rabbits the glycogen of the liver is markedly diminished. Doyon and Kareff[4] caused rapid disappearance of hepatic glycogen by injecting adrenalin chlorid into a branch of the portal vein. The same authors[5] obtained similar results with pilocarpin. Kaufholz[6] has shown that phosphorus poisoning in rabbits is followed by a rapid disappearance of liver glycogen. Kriukoff,[7] who studied the effect of a large number of poisons on hepatic glycogen, reported that, after the subcutaneous injection of arsenic, phosphorus, pulegnon, corrosive sublimate, anilin, phenylhydrazin, pyrogallol, sulphuric acid, sodium hydroxid and carbolic acid, the glycogen disappears from the liver in twenty-four hours, while alcohol has the same effect on hepatic glycogen when it has been injected subcutaneously for a long time. Garnier and Lambert[8] state that, after the intravenous injection of a solution of sodium chlorid, glycogen disappears from the liver. Mohr,[9] who experimented with various gastrointestinal irritants, found the liver free from glycogen after the administration of aloin, croton oil and arsenious acid. Koch,[10] in his studies of corrosive sublimate poisoning, found the same effect on glycogen. Kissel,[11] working in the same laboratory, corroborated the findings of Koch and also made the interesting observation that the disappearance of glycogen in corrosive sublimate poisoning is inhibited by alcohol and glycerol. Bacterial toxins seem to hasten the disappearance of liver glycogen much more than the other poisons mentioned. Thus Luschi[12] found that the glycogen of the liver of animals brought to a maximum of glycogen accumulation is already diminished six hours after infection. Colla,[13] who studied the effect of infectious diseases on glycogen, found that it disappears after tetanus, diphtheria, anthrax, pneumonia. He also studied livers of a number of children who died of diphtheria. Four, ten, twelve hours after death the livers were free from glycogen.

B. In order to answer our second question, rabbits were used as in all the preceding experiments and were fed by mouth through a stomach tube. Various amounts of glucose dissolved in water were given for a period not exceeding twenty-four hours. Alcohol was administered either immediately after the glucose or in some experiments a few hours were allowed to elapse between the last feeding of glucose and the first dose of alcohol. In some experiments two doses of alcohol were administered at intervals of from eighteen to twenty-four hours. In one experiment (No. 28) only one dose was given, while one rabbit (No. 29, a) received three doses of alcohol. As controls, I used rabbits treated in all respects the same as the alcohol rabbits, except that alcohol was withheld. From sixteen to fifty-four hours after the last feeding of glucose the rabbits were killed, the livers rapidly removed and subjected to analysis for glycogen by the shorter method of Pflüger.[14]

The analytic results given in the table show with one exception (No. 26, a) a marked diminution in the glycogen of the livers of the alcohol rabbits as compared with the controls. Thus, sixteen hours after the last feeding of glucose the total amount of glycogen obtained was 3.7 per cent. in the control, while in the alcohol rabbit which received the same amount of glucose (20 gm. in twenty-four hours) the quantity of glycogen found in the liver was 1.76 per cent., less than half that found in the control.

In the next series the rabbits were given a single dose of 5 gm. of glucose per kilo. They were killed twenty-

2. Salant: Am. Medicine, new series, vol. I, No. 1, p. 41.
3. Drummond and Paton: Jour. Physiol., 1904, vol. xxxi, p. 92.
4. Doyon and Kareff: Compt. Rend. Soc. de Biol., 1904, vol. lvi, p. 66.
5. Doyon and Kareff: Ibid., p. 111.
6. Kaufholz: Dissertation, Würzburg, 1904.
7. Kriukoff: Dissertation, Moskau, 1902.
8. Garnier and Lambert: Compt. Rend. Soc. de Biol., 1897, vol. xlix, p. 716.
9. Mohr: Dissertation, Würzburg, 1894.
10. Koch: Dissertation, Würzburg, 1894.
11. Kissel: Centrbl. f. Inn. Med., 1895, vol. xvi, p. 613.
12. Luschi: Jahresb. ü. d. Fortschr. d. Thierischen, 1906, vol. xxxv, p. 349.
13. Colla: Arch. Ital. de Biologie, vol. xxvi.
14. Pflüger: Arch. f. d. Gesell. Physiol., 1902, vol. xciii, p. 163.

eight hours later. Excepting No. 26A, this series showed in a striking manner the action of alcohol in hastening the transformation of hepatic glycogen, for, whereas the amount of glycogen in the controls was 1.14 per cent. and 2.3 per cent., the livers of the two alcohol-fed rabbits were free from glycogen. The administration of alcohol after feeding much larger quantities of glucose (20 gm. per kilo in twenty-four hours) was accompanied by similar results when the rabbits were killed in from fifty-two to fifty-four hours after they received the final dose of glucose. In the two controls of this series the amount of glycogen obtained was .11 per cent in one, 1.14 per cent. in the other, whereas the livers of the two alcohol rabbits were free from glycogen. In another experiment of this series (No. 28, a) the rabbit received the same amount of glucose per kilo in twenty-four hours, but, as he was in a dying condition, apparently from the effects of alcohol, he was killed thirty hours after he had received the final dose of glucose. The liver of this rabbit contained only 1.33 per cent. of glycogen, which is only .2 per cent. more than was found in the control rabbit (No. 25) and about 1 per cent. less than in rabbit No. 26, which received one-quarter the amount of glucose per kilo fed to rabbit No. 28, a.

The discrepancy between the results obtained in No. 26, a, and in the other alcohol experiments of the same series may be explained by the following observations: It was noted that in this rabbit symptoms of severe alcohol intoxication (which set in soon after the second and final dose of alcohol was given) persisted eight hours, while the other rabbits of this group similarly treated behaved at the end of this time as if they had recovered completely from the effects of alcohol intoxication. This difference in the reaction to alcohol is suggestive of the possibility that during the stage of profound alcohol narcosis glycogen metabolism is not affected. Perhaps it is only when recovery from narcosis is practically complete that metabolism of glycogen is resumed.

In the two alcohol rabbits (Nos. 29, a, and 30, a), each of which was killed in a state of deep intoxication, this supposition apparently was not borne out by the results of the analysis. As shown in the table, their livers did not contain any glycogen. The protocols show that the intervals between two successive doses of alcohol were eighteen and twenty-four hours, thus giving sufficient time for recovery from its intoxicating effect. In No. 26, a, the interval was only twelve hours, which may account for the different results obtained.

The suggestion that alcohol does not hasten the transformation of glycogen of the liver during the stage of profound narcosis gains further support from experiments Nos. 21, a, and 23, a, in which large quantities of glucose were followed by alcohol (shortly after in one experiment or three hours later in another). The amount of glycogen found six to twelve hours after the final dose of glucose had been fed was 9.17 per cent. and 8.65 per cent.

It is to be noted that in both of these experiments the rabbits were killed from six to eight hours after receiving large amounts of alcohol in proportion to body weight, that is, at a time before the stage of intoxication passed off. The conclusion seems to be justified, therefore, that large quantities of alcohol may hasten the process by which glycerin is made to disappear from the liver and that it apparently exerts this action only after the stage of intoxication has been passed. This mode of action of alcohol might explain the conflicting results of Nebelthan's[1] experiments, some of which showed disappearance of hepatic glycogen, while in some the presence of considerable amounts were reported after administration of alcohol. It may in the same way also account for the different results obtained by Nebelthan and Kriukoff,[7] whose work was referred to above.

Objection to this conclusion may be raised on the ground that there is a wide range of variation in the amount of glycogen found in the livers of the control rabbits. Thus in experiment No. 28, a, only .11 was obtained, while in No. 31, a, shows the presence of 1.14 of glycogen. This difference may be accounted for by the violent muscular activity when rabbit No. 28 was tied on the holder before he was killed, which did not occur in the other rabbits under the same conditions. Again, in experiments Nos. 25 and 26 (two control rabbits) there was a difference of 50 per cent. in the liver glycogen found, as great a difference as there was between the alcohol rabbit in experiment No. 24, a, and the control. The wide variation in the amount of hepatic glycogen of these two normal rabbits does not invalidate the above conclusions, since in the alcohol rabbits of the same series, Nos. 25, a, and 27, a, which received as much glucose per kilo, and were killed at the same time after feeding glucose as the controls, the livers were free from glycogen. Moreover, the difference in the amounts obtained in the two normal rabbits may possibly be accounted for by a difference in muscular activity. It is of importance to note, in this connection that in the alcohol rabbits intoxication and consequent loss of muscular activity set in about 15 minutes or sometimes even earlier after alcohol was administered, which would tend to inhibit rather than hasten the amylolysis.

TABLE SHOWING THE EFFECT OF STRONG ALCOHOL ON THE METABOLISM OF HEPATIC GLYCOGEN.

Experiment Number.	Weight rabbit in gms.	Weight liver in gms.	Gms. dextrose fed per kilo in 21 hours.	No. CC. of 60% alcohol fed per kilo.	No. hours between last feeding of dextrose and killing.	Per cent. of dextrose found in liver.	Per cent. of glycogen.
24	1,850	51	20	0	16	4	3.70
24a	1,800	52	20	25	16	1.9	1.76
25	1,850	33	9	0	28	1.23	1.14
25a	1,550	48	8	30	28	0	....
26a	1,450	58	7	28	28	3.33	3.08
26	1,120	41	5.5	0	28	2.5	2.3
27a	1,200	36	6	26	28	0	....
28	1,450	30	29	0	54	0.12	0.11
29a	1,450	44	29	35	52	0	....
30a	1,270	41	26	27	52	0	....
31a	1,800	28	36	0	52	1.24	1.14
28a	1,230	45	25	13	30	1.44	1.33
21a	1,050	41	32	20	12	9.34	8.65
23a	815	35	25	11.7	6.11	9.97	9.17

That other toxic substances may exert a similar action on hepatic glycogen in a manner comparable to that of alcohol was shown by Roger.[13] He was the first to find that anthrax has no effect on glycogen during the first stage of infection, but later accelerates its disappearance from the liver.

The present study suggests certain considerations concerning the use of alcohol in infectious diseases. Colla,[13] who studied the influence of glycogen on resistance in infectious diseases, made the very interesting observation that increasing the glycogen of the liver and muscles in rabbits by adding glucose for fifteen days to their daily diet improved their ability to combat bacterial invasion. Although his findings were later disputed by Luschi,[12] which leaves the matter an open question for the present, nevertheless the possibility that such may be the case is of considerable importance, for if resistance to infection is increased by increasing the glycogen

content of the body the administration of large quantities of alcohol in infectious diseases practiced by clinicians is not an unmixed blessing, since, as is shown by my experiments, it tends to diminish the glycogen of the liver, thus possibly robbing the body of a very effective weapon to combat infection.

I am very much indebted to Prof. William J. Gies for valuable suggestions received in the course of this investigation.

IMPORTANCE OF EARLY RECOGNITION AND OPERATIVE TREATMENT OF MALIGNANT TUMORS.

VARIATION OF THE EXTENT OF THE OPERATIVE REMOVAL ACCORDING TO THE RELATIVE MALIGNANCY OF THE TUMOR.*

JOSEPH C. BLOODGOOD, M.D.
BALTIMORE.

Accumulated experience has demonstrated that patients from whom carcinoma and sarcoma have been removed with the knife have remained well sufficiently long to show that cures have been accomplished.

There are two forms of malignant tumors, the epithelial, for which the general term carcinoma is used, and the connective-tissue tumor included under the term sarcoma.

In the onset of their growth, carcinoma and sarcoma are both essentially local diseases. If the neoplasms are removed in this stage cures are accomplished. Carcinoma metastasizes through the lymphatic channels to the neighboring lymphatic glands. Permanent cures are recorded in a certain number of cases when the primary and metastatic areas were properly and completely removed. Sarcoma, as a rule, gives dissemination later than carcinoma, and generally through the blood vessels. After this has taken place the prognosis is hopeless.

Some forms of sarcoma disseminate through the lymphatic vessels and are associated with metastatic tumors in the neighboring lymphatic glands, like carcinoma. It is a question whether cures have been accomplished in this group of tumors.

The etiology of malignant tumors is not established.

At the present time the only accepted treatment of neoplasms is their removal by an operative procedure. Until the etiology of carcinoma and sarcoma has been determined and a new method of treatment based on this etiology elaborated, surgeons must continue to investigate the subject on the principles of early recognition and complete excision of these new growths. The problems involved are: 1. The early recognition. 2. The method of operation.

PROBLEMS IN DIAGNOSIS.

In the problem of diagnosis every lesion simulating a tumor should be considered malignant until every means has been exhausted to demonstrate that it is innocent.

Schönholzer divides the life of a malignant tumor before operating into three periods: The first is the time during which the presence and growth of the tumor do not attract the attention of its host. The second is the time which the patient waits before seeking the advice of a physician. The third, the time which the physician consumes in making a diagnosis. The period of life of the tumor has been recorded with great accuracy in the various large surgical clinics of the world. Nothing can be done to shorten the first, or latent, period. As a matter of fact the relative number of cases in which the neoplasm becomes incurable or inoperable during this stage is small.

To shorten the second period the public must be educated to the fact that malignant tumors are curable and that the probabilities of a cure are increased in almost direct proportion to the promptness with which they are treated. In the last few years there has been a crusade against tuberculosis along these lines. The knowledge of the curability of tuberculosis, its prevention and treatment has been propagated directly to the public. The time is ripe for a similar educational movement on tumors. For example, every woman should be instructed to seek the advice of her physician the moment her attention is called to a mass in her breast, or to any unusual change or sensation in this gland. Every man should be impressed with the danger of delay in the treatment of a small ulcer, or area of hardness in the lower lip, or tongue. All the people should be impressed that the moment they notice any tumor formation, no matter how small or insignificant, they should seek medical advice. If the people can be instructed that the earlier treatment of all tumors is the most important factor in their curability, and that in this earlier stage the operation will also be less mutilating, I am confident that the percentage of cures will be tremendously increased. This is clearly demonstrable in recent years in a number of surgical lesions; for example, appendicitis and strangulated hernia. The public now know that the fatality of these two diseases is due chiefly to delay. In some instances, greatly to the discredit of the general profession, the family or the patient have carried this acute abdominal lesion to the surgeon without delay and over the advice of their family physician.

To shorten the third period, the general profession must be impressed by accurate and conscientious statistical studies from surgical clinics that the truth of the statements made in this paper is unquestionable. It is an improper method for the specialist, for example, the surgeon, to appeal to the public over the head of the general practitioner. Future progress in surgery, in the great majority of diseases, is in the hands of the general practitioner. He sees the patient first. The education of the public belongs to him. The general practitioner or family physician is in much closer contact with the people. The specialist, the surgeon, has more than enough to train himself for the new requirements in the diagnosis and operative treatment of surgical lesions when they are brought to him in this much earlier stage.

Accumulated experience in surgical lesions, especially neoplasms, demonstrates that the easier the clinical diagnosis the worse the prognosis. By clinical diagnosis I mean the differential recognition of the surgical lesion from the data of the history and examination. The earlier surgical lesions come to the surgeon for treatment the more difficult the diagnosis. This fact brings up another problem in diagnosis which belongs strictly to the domain of surgery when a positive clinical diagnosis cannot be made as to the nature of the trouble, the question to be answered is: Does the clinical history and findings at the examination justify an operation which exposes the seat of the trouble to the eye? In such cases the surgeon must have sufficient pathologic knowledge to enable him to differentiate the various pathologic possibilities by their naked-eye appearances.

In this effort to improve the results of surgery the general practitioner and surgeon work together. The

* Read by invitation at the meeting of the Buffalo (N. Y.) Academy of Medicine, May 1, 1906.

province of the general practitioner embraces the education of the public and of himself. Among a large group of patients daily seeking his advice he must be keen in the recognition of those few in whom there should be no delay in surgical consultation. It appeals to me that the general practitioner should consider this separation the most important feature of his day's work, and an intellectual achievement which gives him the greatest enjoyment. His responsibility is even greater than the surgeon's.

On the other hand, the surgeon must feel the responsibility of the new requirements of diagnosis, and fit himself for this task. The surgeon of the future must be his own pathologist, and this transformation does not trespass on the field of the general pathologist. The two should work together. The surgeon brings to the pathologist his greater experience with the clinical aspects and the ultimate results of disease, and the fresh appearance of the living tissue. The pathologist contributes his greater and more expert knowledge of the cellular picture. In this coöperative study the surgeon improves his art of clinical diagnosis and makes more scientifically correct and acute his optical recognition of the gross differences of the various surgical lesions. I am sure that the pathologist will also reap the benefit of a closer and more practical relation of his department to surgery.

In regard to tumor formation, the earlier they come to the attention of the surgeon the more frequently is an exploratory incision absolutely necessary. At this exploratory incision with the exposure of the diseased tissue it is essential, for the benefit of the patient, that a correct diagnosis be made at once, to be followed by an operative procedure, the extent of which is based on this diagnosis. At this exploratory incision it is unjustifiable to cut out a piece of tissue for examination, to close the wound and to wait for a microscopic diagnosis.

There are two methods of making the diagnosis at the exploratory incision; one, the recognition by the gross appearances; the other by the examination of a frozen section which can be made in five or ten minutes. It has been my experience that when it was difficult or impossible to differentiate with the naked eye, the rapid frozen section offered no better clue. With the proper training it is not difficult for a surgeon to make a gross diagnosis in the majority of cases.

I can illustrate the necessity of the exploratory incision and the importance of an ability to make a naked-eye diagnosis by a consideration of breast tumors and lesions of bone. In a woman with a tumor of the breast in which a clinical diagnosis of carcinoma can be made the surgeon proceeds with the complete operation without cutting into the tumor. In many tumors of the breast a clinical diagnosis of carcinoma can not be made. What shall be done? Shall we delay, or is the complete operation for carcinoma to be done? If one delays and the tumor is cancer precious time is lost. If one proceeds with the complete operation for carcinoma and the tumor proves benign, the patient is unnecessarily mutilated. If the surgeon, however, cuts down on the tumor and has the ability to recognize its nature from the naked-eye appearances, he is prepared to follow the indications immediately. If the tumor be malignant, he immediately proceeds with the complete operation; if the tumor be benign the nature of the operation differs with the character of the benign tumor, as will be discussed again under breast tumors; in some cases the tumor only is removed, in others the entire breast should be excised, in a few cases recent investigation has demonstrated that both breasts should be amputated.

In lesions of the bone, even with the aid of the tuberculin test and the *x*-ray, a positive differential clinical diagnosis can not be made in many cases. The earlier the patient seeks advice after the first symptom the more difficult the diagnosis. One must always bear in mind the possibility of a malignant bone tumor. The age of the patient, of value in excluding a malignant tumor of the breast, is of no aid in a bone lesion. Malignant tumors of bone have been observed at all ages. Extensive operations, even amputations, are indicated in some malignant bone tumors. This operation is a mutilating one. The same questions arise as in a doubtful tumor of the breast. One is not justified in mutilating the limb of an individual unless the positive diagnosis of the disease justifies it. For this reason, in these doubtful cases, one must expose the lesion for a naked-eye diagnosis. It may be syphilis, in which case nothing is done; in tuberculous and pyogenic osteomyelitis very conservative operations are sufficient; in a benign bone cyst and in some forms of giant-cell sarcoma curetting is sufficient; in other bone tumors local resection with the preservation of the continuity of the limb and its function give the patient just as much assurance of a permanent cure as an amputation; in other more malignant bone tumors amputation is justifiable.

Considering only tumors of the breast and lesions of bone as examples, the new problems of diagnosis and operative treatment are all involved. If the public is educated to consult the general practitioner at once, and the general practitioner fulfills his obligation to the patient by immediate consultation with the surgeon, the surgeon must be prepared to meet these new requirements of diagnosis. Otherwise the continuity of the scheme is broken at the most important point. If the surgeon has not developed the ability to make a diagnosis in this early stage, the patient had better be left alone; those suffering with benign lesions will not be unnecessarily mutilated, and those with malignant tumors will not have the disease disseminated by an operation which consists of the cutting out of a piece of tissue and closure of the wound. A delay until a positive clinical diagnosis can be made is less dangerous than treatment in this earlier stage which is based on incorrect conclusions.

THE SURGEONS AND DIAGNOSIS.

How can surgeons acquire this ability to recognize the various surgical lesions by their naked-eye appearances? I have ventured the statement on a number of occasions that surgical technic is in advance of surgical diagnosis. One learns the technic of a modern surgical operation in the majority of cases much more quickly than one does the early diagnosis of the disease for which the operation is indicated. The medical student should be instructed chiefly in diagnosis. In the surgical department there should be systematic teaching on the pathologic anatomy, gross and microscopic, of all surgical lesions. Every surgical clinic should have its own pathologic laboratory. Cases admitted to the surgical clinic should be subjected to the most searching inquiry as to the history and the findings at the physical examination. Instruments of precision and new methods of diagnosis should be employed. All of these data should be carefully recorded. At the present time, with these methods, in a large number of cases, probably the majority, a clinical diagnosis can be made. For this

reason the surgeon proceeds to the indicated operation without an exploratory incision.

After the tumor has been removed the surgeon and his associates in the clinic should make a careful inspection of the naked-eye appearance of the diseased tissue, and a clear description should be recorded; if possible, the tissue should be painted by an artist or photographed in the fresh. A frozen section should be immediately made, so that while the gross appearance is still fresh, the surgeon can quickly associate with it the microscopic pictures. A piece of the tumor should be preserved for future inspection as a museum specimen, in alcohol, or better in Kaiserling's fluid, which preserves to a certain extent the color. A block of tissue should be hardened in Zenker's fluid and as quickly as possible a permanent microscopic section should be made and examined. The daily repetition of this routine procedure establishes the continuity of the clinical picture, the gross appearance and the microscopic histology. It not only improves the surgeon's ability to make a more accurate clinical diagnosis, but he soon learns to interpret properly the gross appearances and make a naked-eye diagnosis. In this way he prepares himself and his students for those doubtful cases in which the diagnosis must be made at the exploratory incision.

For example, take a carcinoma of the breast. If the surgeon has carefully studied the gross and microscopic appearances of all the malignant tumors of the breast which have come under his observation, in which a clinical diagnosis could be made and in which the operation has been performed without an exploratory incision, he will have no difficulty in recognizing this tumor when he cuts into it, if the tumor had a clinical picture in which a diagnosis could not be made. A small scirrhus carcinoma so deep in a large fatty breast does not differ in its naked-eye appearances from the older and larger tumor in which a clinical diagnosis can be made without difficulty.

I find frequent statements in the literature that an exploratory incision into a malignant tumor is a dangerous procedure, but practically, what is to be done if the diagnosis can not be made from the history and examination? My own experience demonstrates that the danger of delay is far greater than the danger of an exploratory incision. No one is justified in mutilating an individual by an extensive operation, unless a correct diagnosis of the nature of the disease can be made which justifies this procedure. As a matter of fact, I have been unable to demonstrate any cases of dissemination when the exploratory incision has been properly made into a doubtful malignant tumor, provided an immediate operation followed.

In malignant tumors of the breast, considering all cases, 47 per cent. of the patients have remained well and free from recurrence three years after operation. When we consider the malignant tumors of the breast in which a clinical diagnosis could not be made in the surgical clinic of the Johns Hopkins Hospital and in which an exploratory incision was performed, there has been but one death in 25 cases. That is, 96 per cent. of the patients have remained apparently well 3 years; some, 14 years. In this one patient who died of internal metastasis the tumor was a small scirrhus carcinoma, and the glands in the axilla showed metastasis. The latter finding can explain the internal dissemination better than the dissemination by the exploratory incision. In the majority of bone tumors which have been cured, exploratory incisions were made. Exploratory incisions were necessary in only a very few of the cases of bone tumors in which the patients died later of internal metastasis.

I believe I am justified by the facts in the statement that the earlier surgical lesions, especially tumors, come to the surgeon for treatment, the more frequently will an exploratory incision be necessary, and that this exploratory incision is less dangerous than delay or an operative procedure without it; further, that surgeons must acquire the ability to recognize surgical diseases by their naked-eye appearances. Undoubtedly, the investigation of surgical lesions along these new lines will develop in the surgeon an increasing power in correct clinical diagnosis, and decrease the number of exploratory incisions into malignant tumors.

WORK IN THE SURGICAL PATHOLOGIC LABORATORY OF JOHNS HOPKINS HOSPITAL.

More recent clinical and pathologic study of tumors has demonstrated that malignant tumors, both sarcoma and carcinoma, vary in the relative degree of their malignancy. This knowledge allows in some cases a less radical, local operation, and in all cases is of great interest in prognosis. The results of the clinical and pathologic study of tumors in the pathologic laboratory connected with Professor Halsted's clinic of the Johns Hopkins Hospital can be expressed in the following paragraphs:

First, I wish to record my obligation to Dr. Halsted for the opportunities, the introduction to which I owe to his suggestion and association. The laboratory connected with his surgical clinic was started by me in May, 1892, nearly fourteen years ago, and at the present time we have records of almost 8,000 cases. It has been the rule of the laboratory to associate with every specimen received its clinical history, and as far as possible to record from year to year the ultimate condition of the patient from whom the specimen was removed.

At the present time the clinical and pathologic investigations have been published in a series of pamphlets which are now used for teaching purposes. In *Progressive Medicine* for December of each year from 1899 to 1905, material from the laboratory has been used and illustrated for the discussion of the more recent literature. During the past year I have begun a publication of short monographs. Papers on "Thyroid Cysts" and "Thyroid Adenoma" have so far appeared in the *Journal of Surgery, Gynecology and Obstetrics*. I trust to be able to continue this from time to time.

Epithelial Tumors: In an investigation of some 900 cases of epithelial tumors of the skin and mucous membrane I found that Krompecher's classification into two great groups, the epithelioma basocellulare and the epithelioma spinocellulare is of great practical importance. The epithelioma basocellulare is of a relatively low grade of malignancy. It occurs most frequently on the skin of the face, nose, forehead and upper lip. It has little or no tendency to metastasis. Local excision is sufficient. When the tumor is small and situated on the alæ of the nose or an eyelid, positions where complete excision would produce some mutilation, an *x*-ray treatment is justifiable, as there is no harm in this delay, and in some cases it has been successful, while so far in my experience complete local excision of the tumors which have not disappeared under the *x*-ray treatment has also been invariably successful. The epithelioma spinocellulare is a much more malignant tumor. Its most common situation is on the lower lip. In these cases not only should the tumor be removed by a wide

local excision, but the entire lymphatic glands beneath the jaw, from parotid to parotid, should be excised.

Space forbids further details, but it is of the utmost importance for the public to be educated and the general practitioner to be keen in their attitude to small and apparently innocent warts, nodules, scabs, ulcers and little areas of induration on the mucous membrane of the lower lip, tongue and mouth, skin of face, in an individual over thirty. Many of these represent the early stage of the malignant epithelial tumors and when completely removed in this early period, permanent cures are accomplished in the majority of cases. Permanent cures are recorded in epithelioma of the tongue and lower lip when the glands removed have shown areas of metastasis.

But the relative number of such cures is small. I have two cases in which second operations were performed for the removal of metastatic glands lower down in the neck. These patients are well three and seven years since the first operation. Future progress, however, in these tumors depends more on early treatment than an extension of the radical neck operation. Ability to recognize the different forms of epithelial tumors allows the surgeon to restrict or extend the operative procedure according to the malignancy of the primary growth. I have a record of a few cases in which the penis has been amputated for a benign epithelial wart, cases in which a local resection with the preservation of the organ would have accomplished a cure just as well. In many epithelial tumors of the penis the glands in both groins should be removed, and permanent cures have followed even though the glands showed metastasis.

Sarcoma of the Skin and Soft Parts: In the records of the pathologic laboratory and in the literature I have been unable to find a permanent cure in the pigmented alveolar sarcoma arising in a congenital pigmented mole. The time to remove this mole is in its benign state. Practitioners should be on the lookout for congenital moles and advise their immediate excision. I believe it would well repay if a hundred such moles were removed in order to save one patient from death due to malignant degeneration. The congenital nevus is less likely to be the seat of a sarcoma later in life. The resultant tumor, however, the perithelial angiosarcoma has a high grade of malignancy and cures are rarely accomplished. The benign single fibroma of the skin or one of the tumors in fibroma molluscum may later in life become a sarcoma. In view of these facts the general profession should change their attitude toward the so-called congenital and acquired, small and innocent tumors of the skin. The time for their removal is in their benign state.

Sarcoma may be divided into two great groups, the angiosarcoma and the simple sarcoma. Angiosarcoma arises from the endothelium of the blood or lymph vessels (endothelioma), or from the cells in the outer walls of these vessels (perithelioma). These tumors are very malignant. Cures are seldom accomplished. Now and then we observe endothelioma of a relatively low grade of malignancy and a few cures have been recorded. Simple sarcoma arises from the fixed connective-tissue cells. It varies in its cellular picture from a fibro-spindle-cell fibrosarcoma to a pure round-cell sarcoma. The greater the number of round cells the greater the malignancy of the tumor. Simple sarcoma showing myxomatous degeneration or containing numerous giant cells has a relatively low malignancy.

When we have a tumor situated in the soft parts beneath the skin it is impossible, in the majority of cases, to make a correct diagnosis in the early stage. The possibilities are too numerous to mention. It may be one of the various benign connective-tissue tumors, fibroma, myxoma, angioma, lipoma, a rare lymphatic cyst, or some inflammatory lesion of the muscle. The correct diagnosis as a rule can be made at the exploratory incision. This pathologic knowledge allows an operative procedure according to the nature of the tumor, patients are not unnecessarily mutilated, and are given the best assurance of a permanent cure. I am confident that amputation is often unnecessarily performed for many of these lesions.

Bone Tumors: There is no more interesting field than this subject, and perhaps in no other place is the correct diagnosis of the lesion of more importance to the patient. In recording the ultimate results of all the bone tumors studied in the pathologic laboratory I was struck with a very important fact. In certain varieties of sarcoma not a single cure had been observed. These tumors were spindle and round-cell, periosteal or medullary sarcoma—tumors which produce rapid bone destruction and are associated early in their growth with pathologic fracture. In spite of amputations at the highest point these patients died of metastasis. The duration of life was seldom longer than two years from the onset of the first symptom. In the other varieties of sarcoma and bone tumors permanent cures were almost invariably accomplished. For example, the benign bone cyst, the periosteal and medullary giant-cell sarcoma, the periosteal ossifying sarcoma, the periosteal fibrosarcoma, and the medullary myxosarcoma. In the benign bone cyst and in the medullary giant-cell sarcoma in which there is still a thick shell of bone, curetting is sufficient. In the other forms local resection will accomplish a cure, apparently just as certainly as amputation at the highest point. One amputates the limb only when the local growth has been so extensive that its removal would leave an extremity without function.

When these various tumors can not be recognized from the clinical picture or the *x*-ray it is not difficult to make a correct diagnosis at the exploratory incision. This should be done under an Esmarch bandage. As a matter of fact the gross appearance of the different bone lesions is distinct. These various tumors, solid and cystic, syphilitic, tuberculous and pyogenic osteomyelitis, all have a gross pathologic anatomy not at all difficult to interpret when exposed to view. The *x*-ray is the most important aid in the clinical diagnosis. It is of the greatest importance, not only for the life of the individual, but for the saving and function of his limb, that these bone lesions be recognized early. Local pain referred to a bone should always be regarded as suspicious and an *x*-ray negative immediately made. Too often such cases are called rheumatic and treated with drugs and massage, until the definite swelling or pathologic fracture forces the recognition of a serious lesion which should and could have been recognized before.

In tumors involving the upper and lower jaw the same principles apply as to early diagnosis and operative treatment. The epulis is a relatively benign lesion and can be treated by a local excision. In very early cases I believe it is justifiable to attempt to save the teeth. The adamantine epithelioma arising from the epithelial enamel plate is a tumor observed only in the jaws. I was surprised at the permanent cures, and in the future, I am convinced that less radical procedures can be em-

ployed in their removal. In the benign dentigerous cyst excision is never necessary. In the more malignant sarcomas involving the upper and lower jaw, the spindle and round-cell sarcoma, mentioned before, cures have not been accomplished by the most radical and mutilating operation. In the other varieties, if the patients come for operation in the early stage, local resection is sufficient. In many cases the continuity of the lower jaw can be preserved. In tumors of the upper jaw the hard and soft palate need not always be removed. Time forbids further detail. If the surgeon familiarizes himself with this pathologic knowledge, he will be able to give his patients with jaw tumors just as much assurance of a permanent cure, and in the majority of cases accomplished with very little mutilation.

The most distressing results are those in the so-called carcinoma of the upper jaw. These tumors may arise from the mucous membrane of the antrum or nose, or from benign polypoid growths in the nares. I was unable to find a permanent cure in any case recorded in the laboratory. The majority of these give a history of nasal polypi of many years' duration, and usually a history of one or more operations through the nose. I am impressed that future progress in the treatment of these jaw tumors rests with the rhinologist. He should train himself to recognize that form of nasal polypus which has a tendency to become a carcinoma, and institute at once more radical measures for its removal in the early stage.

Thyroid Tumors: Thyroidectomy in exophthalmic goiter is performed for the alleviation of the general symptoms due to the excessive or pathologic secretion of the thyroid gland. In simple goiter the tumor is removed to relieve the patient from the discomfort of its size or from pressure symptoms. The asymmetrical tumors of the thyroid are cysts and adenomas. In the experience of the laboratory and in surgical literature very few permanent cures are recorded after the removal of malignant tumors of the thyroid. When these cures have been accomplished the primary tumor could not be differentiated clinically from a benign cyst or an adenoma. For this reason, in an individual over thirty every asymmetrical tumor or nodule in or near the thyroid gland should be regarded as suspicious and immediately removed. If it prove to be a benign adenoma or cyst, the patient is relieved of a tumor which later would probably have to be excised on account of increasing growth. On the other hand, if it prove to be a carcinoma the patient is given the best chance of a permanent cure.

Parotid Tumors: The so-called mixed tumor in, or in the neighborhood of, the parotid or salivary glands, is a benign tumor, encapsulated and of slow growth. It should always be removed, but it is unnecessary to sacrifice the facial nerve. This nerve can usually be dislocated from a groove in the tumor. In the malignant tumor of the parotid gland I have never observed a permanent cure. Unfortunately, all of these cases came to the surgical clinic late.

Breast Tumors: I believe the facts justify the statement that every single tumor in the breast of a woman over twenty-six should be immediately subjected to operation. If a clinical diagnosis of a carcinoma can be made, the breast, an area of skin, both pectoral muscles, and the axilla should be removed in one piece. If the higher axillary glands are involved a complete dissection of the fat and glands in the supraclavicular fossa should be done. If a clinical diagnosis of a malignant tumor can not be made, the tumor should be exposed at once by an exploratory incision. If the tumor proves malignant, the wound should be burnt with the actual cautery or pure carbolic acid, and the complete operation immediately performed. It is not difficult to recognize the encapsulated benign tumors: the intracanalicular myxoma, the less frequent adenofibroma, and the rare cystic adenoma. In these cases one removes the tumor with a small zone of surrounding breast.

If the exposed tumor proves to be a cyst a differential diagnosis is of the greatest importance. If the cyst has a thin wall, a smooth surface, and non-hemorrhagic contents, and the surrounding breast is normal, excision of the cyst with a small zone of breast tissue is sufficient. If the cyst contains a papilloma, the entire breast should be removed. It is important to remember that the papillomatous cyst may contain blood. This is not an indication that the papilloma is malignant. About 50 per cent. of these cysts with intracystic papillomatous growths are malignant, however. The malignant infiltration takes place at the base of the papilloma. This area should be exposed. If there be any doubt as to the benignity, I should advise the complete operation for carcinoma. Every smooth-walled cyst containing blood has proved to be a cancer cyst. For this reason, if the explored cyst contains blood and no papilloma, immediately perform the complete operation for carcinoma. Thick walls, smooth cysts, with cheesy or very granular, non-hemorrhagic contents, are usually cancer cysts, and should be subjected to the complete operation.

The most difficult problem in breast surgery is the recognition of senile parenchymatous hypertrophy, known under the names of Reclus' or Schimmelbusch's disease, adenocystoma, cystic disease of the breast, abnormal involution. This lesion presents itself as an area of induration. At the exploratory incision one finds in the indurated quadrant of the breast areas of increased parenchyma, numerous minute cysts, and little cavities filled with a granular material. It is my opinion that the entire breast should always be removed; as the disease is very likely to be bilateral, recently I have removed both breasts. The lesion has a strong tendency to become a carcinoma. If the surgeon has any doubt as to the stage, I believe it would be better for the patient that the complete operation for carcinoma be performed. The larger and the more numerous the cysts in this disease, the less the probability of a malignant infiltration. In some cases in which there are multiple simple cysts, I believe the plastic resection of two or more cysts, as advocated recently by Warren of Boston, is justifiable. It saves the patient the mutilation of the removal of the breast.

The general practitioner has the new responsibility of bringing patients to the surgeon with tumors of the breast the moment they are observed; and the surgeon must prepare himself with this pathologic knowledge which will allow him to treat the non-malignant tumors of the breast without mutilation, and to give the malignant tumors of the breast the most extensive operative removal.

The relative degree of increasing malignancy is well illustrated in carcinoma of the breast. As stated before, in all tumors 47 per cent. remained well three years. In the comedo-adenocarcinoma, a basal-cell duct cancer, the probability of a cure is 97 per cent., while in the cancer cyst and in the large infiltrating scirrhus it is only 20 per cent. In the less malignant cancer of the breast there is frequently no metastasis to the axillary glands. At the present time I can see no justification for re-

stricting the operation for carcinoma of the breast. The same extensive excision should be performed in all cases. The time, however, may come when our knowledge will allow us to perform a less radical operation in the early stage of the less malignant tumors of the breast.

Carcinoma of Stomach and Uterus: There is one other problem in the operative treatment of tumors, exemplified in the present-day attitude toward carcinoma of the stomach and the uterus. I believe it has been established that an exploratory laparotomy is justifiable on any patient in whom there is the slightest suspicion pointing to a carcinoma. When the stomach is exposed pylorectomy should be performed for every definite malignant tumor, if it is possible, and this should also be done for every doubtful indurated mass in the stomach wall. This pylorectomy consists of the removal of a small portion of the duodenum and a portion of the stomach including the entire lesser curvature with its glands, and a certain portion of the larger curvature with its glands. The more radical removal of the stomach and especially the more radical dissection of the glands which may be possibly infected in carcinoma, although theoretically correct, has been abandoned by the majority of the surgeons because the mortality of this more extensive operative removal is so great and the possibility of a cure, if metastasis has taken place to such a wide extent, is too small.

The presence of hemorrhage from the uterus, which can not be explained by the menses, is now considered by gynecologists an indication for curetting and the microscopic examination of the material removed. In the operative treatment of carcinoma of the uterus the more extensive dissection of the broad ligament and the removal of the various lymphatic glands from the pelvis, has such an increased mortality, and the probabilities of a cure when these glands are involved are so slight, that the majority of gynecologists of to-day do not believe that this more radical operation is justifiable. That is, in some forms of tumors, if the lymphatic glands are involved, the more radical removal of the possible lymphatic involvement should be restricted, if the mortality of the operation is greater than the possibility of a permanent cure.

THE THERAPEUTIC USES OF THYROID PREPARATIONS.*

OLIVER T. OSBORNE, M.A., M.D.
Professor of Materia Medica, Therapeutics and Clinical Medicine at Yale University.
NEW HAVEN, CONN.

Unfortunately, we are not much farther advanced in the chemistry of the thyroid gland than we were two years ago when I wrote the section on organotherapy for Cohen's "System of Physiologic Therapeutics." In other words, we can not give any one portion of this gland activity to a patient without giving the whole of it. We know that the active principles are absorbed from the gastrointestinal canal, but whether any particular activity is lost in this chemistry we do not know.

The physiologic symptoms developed by feeding thyroid are well known, viz., thyroid extract will increase the rapidity of the heart; increase perspiration; cause warming of the surface of the body, in other words increase the peripheral circulation; lower the blood pressure; stimulate mental activity even to sleeplessness; cause increased nitrogenous metabolism, and if in considerable amount or given for a time, cause loss of weight. The physiologic actions of the gland we know. We know the counterpart of feeding this gland, namely, the symptoms of Graves' thyroid disease. We are perfectly familiar with the symptoms of absence of function of this gland as seen in myxedema and cretinism.

I have said so many times during the last five or six years that we must take into account the varying degrees of the activities and functions of this gland as almost to feel ashamed to repeat it, viz., that all varying increased secretions of this gland will give symptoms, and all varying decreased secretions will give symptoms. With a fully developed exophthalmic goiter with all the attending symptoms at the top of the line, and with normal secretion and function in the center of the line, there may be all variations of tachycardia, hot flashes, profuse sweatings, nervous irritability, restlessness, loss of weight, profuse menstruation, neurotic tendencies, and hysterical phenomena of all kinds. While at the bottom of the line, at equal distance from the center as is the exophthalmic goiter above, is myxedema, and between the center of equilibrium and myxedema are such conditions as connective tissue formations, arteriosclerosis, slow heart, high blood tension, obesity, diminished menstruation, toxemias as seen in uremia, and probably some blood disturbances.

The thyroid gland is easily excited temporarily to increased secretion by emotion, grief, sexual excitement, and for a more prolonged period during menstruation and pregnancy. It is thus seen that the thyroid is a much more active and necessary gland in women than in men, and in fact nearly three-fourths of all cases of disturbed thyroid secretion, either more or less than normal, occur in women. The nervous, excitable, irritable girl at puberty is so because this gland is in an unstable condition. It is often either over-doing or under-doing its normal functions. The profuse menstruation of young girls is largely due to excessive activity of this gland, whereas under-activity of it gives amenorrhea and often chlorosis; and many times chlorosis is as successfully treated with small doses of thyroid as with iron and in amenorrhea nothing in the whole Pharmacopeia is, in my opinion, at all comparable to the action of thyroid. On the other hand, in girls with profuse menstruation I have often found mammary extract very efficient in combating the flow, and physiologically when the mammary gland is functionally active menstruation is generally in abeyance.

Again, this emotional gland is over-secreting in various hysterical manifestations of women, and this is largely the cause of the nervous wrecks we see from excessive venery in young women, and its enlargement may have something to do with the typical hoarse voice. Later, this gland, if over-worked, like any other over-worked gland of the body, is likely to cease its function and to become atrophied, largely due to connective tissue formation; the symptoms of under-secretion develop, more evident in women than in men, as evidenced by almost always the laying on of fat after the menopause. The thyroid has been found degenerated in adiposis dolorosa, and I have benefited such cases by feeding thyroid.

As age advances, from fifty on, the thyroid normally begins to secrete less than at earlier ages. Vasomotor tension therefore increases, arteriosclerosis develops, and we have normal old age, viz., arterial disease, and with

* Read in the Section on Pharmacology and Therapeutics of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

it all the phenomena of connective tissue deposits. Finally, as the gland more and more diminishes its secretion, senility develops, the skin becomes dry, and eczemas may occur, and these eczemas are improved by the administration of thyroid. The nervous excitability of our present lives leads to the over-stimulation of the thyroid; and with nervous tension, strain and alertness, causes men to have arteriosclerosis and its phenomena earlier than formerly.

One more fact must be taken into consideration, viz., that any gland may have its chemistry so disturbed as to offer a *perverted* secretion, perhaps neither too much nor too little as a whole, but with its various elements in an abnormal relation to each other. This is doubtless the reason that in some cases of hemophilia thyroid feeding has been successful, while in other cases it has made the condition worse.

The thyroid, I believe, has something to do with the production or destruction of the red blood corpuscles. I have seen patients with chlorotic anemia have their blood counts improved under thyroid. I have seen cases of epistaxis and uterine hemorrhages in stout, overweight women, with slow pulse, in which this bleeding was stopped by thyroid. On the other hand, thyroid, as above stated, will make stout, over-weight women who have amenorrhea menstruate, and thyroid will make normal women menstruate more profusely.

The thyroid also has something to do with sugar metabolism. Glucose has many times appeared in the urine when thyroid treatment has been pushed, and I have seen cases of diabetes in which the sugar output greatly increased under thyroid treatment. Myxedema has often been complicated with diabetes, and diabetes has often been an accompaniment of acromegaly, in which disease the thyroid is always diseased. Cretins have developed diabetes under thyroid treatment.

Besides the physiologic and psychic stimulations of the thyroid gland, certain drugs affect it. Alcohol excites it, and iodin, in any form, is a stimulant to it. Arsenic, I believe to be a stimulant to it, and this is doubtless the reason that arsenic does good in chlorosis. Phosphorus is probably a stimulant to it. Prolonged actions of such metals as lead and mercury, I think, inhibit the action of the thyroid. This is doubtless one of the causes of the connective tissue formations which can occur (due to diminished thyroid secretion) as the sequelæ of a long, previous mercury-treated syphilis. Possibly, some of the efficiency of the iodid in syphilis is due not only to the liberation of mercury from the tissues and perhaps thus to remercurialize the patient, but also to the stimulant action of iodin on the thyroid gland. Other drugs which I believe diminish the secretion of the thyroid are strophanthus, bromids, atropin and lime, as perhaps best administered in the glycerophosphates.

It is interesting to note that Lanz[1] reports that he has found that dogs, cats, goats and hens are usually unable to procreate after thyroidectomy. He has also observed the same effect in two human subjects. One was a man, who was apparently deprived of all sexual functions by complete removal of the thyroid gland. Thyroid administration, however, was followed by the gradual restoration of the function. The other was a woman. The menses reappeared under thyroid treatment after they had been entirely suspended by thyroidectomy.

There is more iodin in the thyroids of people living at the seashore and in people living in the goiter regions than elsewhere. There is more at maturity than in youth or old age. In cancer the iodin is increased, but it is found decreased in infectious diseases and tuberculosis.[2]

An excessive meat diet modifies the structure and hence the secretion of the thyroid. This has been noted by Watson,[3] and I believe is a fact. Certainly, when there is much hypersecretion in exophthalmic goiter the patient is much better on a diet without meat.

PARATHYROID GLANDS.

A discussion of thyroid physiology is not complete without reference to the parathyroids. Doubtless some of the symptoms of thyroid extirpation are due to concomitant extirpation of the parathyroids. Also it is possible that some of the preparations of thyroid are contaminated with extracts from parathyroid. Even in pathologic conditions it is quite possible that diseases which we have considered due to decreased or increased secretion of the thyroid, may really be due to disturbances of the parathyroid secretion. Careful investigation of the pathology of these glands as a routine procedure in every case of autopsy in which their removal can be accomplished, is the only way to enlarge our knowledge of their functions.

The number of parathyroids in animals varies considerably; if all are removed the animals die in convulsions, and MacCallum states that removal of the parathyroids alone will cause, in a few days, twitching of the muscles, sometimes spasms, incoördination and partial paralysis of the legs, dyspnea, and finally death from exhaustion. He thinks that the cause of these symptoms are toxins circulating in the blood due to the absence of parathyroid secretion. Tetany may be due to a disturbance of the parathyroids. Exophthalmic goiter, myxedema, and cretinism are probably not caused by disturbances of the parathyroid.

Parathyroid extracts have been used with success in eclampsia, and Berkeley[4] has used it with considerable success in paralysis agitans.

THERAPEUTIC USES.

It is unnecessary to discuss the successful use of thyroid preparations in cretinism and myxedema. In ordinary goiter I believe thyroid extract will often do harm by stimulating the gland to increased secretion and perhaps causing the exophthalmic form to develop from a simple goiter. If the goiter consists largely of cystic degeneration, small doses of thyroid may be physiologic, while large doses have seemed in some instances to cause goiters to decrease in size. However, I believe an iodid will do as well and much more safely. In other words, I do not believe that it is good treatment to give large doses of thyroid in goiter.

In exophthalmic goiter thyroid is positively contraindicated. It will always aggravate the symptoms. In cases in which the disease is not typically developed, some symptoms present and some not, with certain kinds of symptoms absent, thyroid might be given, as there is probably in these cases a perverted thyroid secretion. Cases of exophthalmic goiter reported to have been improved by thyroid were probably at a period when the thyroid began to diminish its secretion and the case was naturally curing itself. And we know that under many treatments exophthalmic goiter often tends to recovery.

In doubtful cases of nervous phenomena where the question is whether thyroid will help the case or make it

1. Arch. f. Chir. Langenbeck's, Berlin, 1904, vol. lxxiv, No. 4.

2. Mittellungen a. d. Grenzgebelten d. Med. u. Chir., Jena, vol xv, Nos. 3-4.

3. New York and Phila. Med. Jour., May 6, 1905.

4. New York and Phila. Med. Jour., Dec. 19, 1905.

worse, I believe the following symptoms are against the use of thyroid: Cerebral excitement, palpitation, progressive loss of weight, sweatings, and flushings. If, on the other hand, the patient is drowsy, apathetic, gaining weight, and the pulse is rather slow, thyroid may be of benefit. If a case is doubtful, a few days of thyroid feeding may aggravate unpleasant symptoms so much as to contraindicate its further use. There can be no doubt that the proper treatment of exophthalmic goiter is one of the antithyroid preparations or serums. These preparations certainly antagonize the thyroid hyperactivity. I am not yet sure of the dose, or whether such treatment can be pushed or prolonged with safety.

In severe exophthalmic goiter we should consider the removal of a portion of the thyroid gland. The danger from this operation is much less than was supposed.

Obesity is well treated by small doses of thyroid long continued. Large doses, I believe, are dangerous, and should not be used. Small doses, from twenty to thirty centigrams of the dried gland, two or three times a day, are generally sufficient. This treatment is especially valuable in obesity in young people, and especially in young women under forty, who have scanty menstruation and at the same time are growing obese. After the cessation of menstruation, when all menopause symptoms have disappeared and the weight is increased more than seems normal, thyroid will often be of value. This is no myth. I have seen case after case in young women with scanty menstruation, or amenorrhea, becoming obese, especially on the abdomen and around the breasts, and oppressed for breath, in which this feeling of fullness was rapidly ameliorated, some of this extra weight removed, and menstruation began after several weeks of thyroid treatment. If, at any time, during the administration of thyroid, palpitation or muscular weakness occurs, too much is being given.

When perspiration is nearly absent and the skin dry and scaly, whether occurring in infancy or in old age, small doses of thyroid are valuable.

In high blood tension after fifty I have seen marked benefit from the prolonged administration of small doses of thyroid, and the same is true in the asthma of old age.

I have now on my records a number of cases of epilepsy treated successfully with thyroid. My attention was first drawn to the use of this preparation in epilepsy by several cases occurring in women at the time of the menopause, the attacks showing a suggestive periodicity. In several other cases in young girls at the time of puberty the attacks showed a periodicity. There being no assignable lesions or injuries in these cases to account for the epileptic attacks, I reasoned that they must be purely toxic, and that this toxemia was in excess periodically when the patient should have menstruated.

Many of these patients had received bromids, and while this postponed or controlled the epileptic attacks, general debility and bromism were appearing. In the young girls I used thyroid as an emmenagogue with the belief that normal menstruation would prevent the attack of epilepsy. I found that it did. I then used the thyroid in the menopause cases, in some continuously in small doses, and in others a few days a month at a possible menstrual epoch. I found that I could control and prevent the epileptic attacks as well with thyroid as could be done with bromids and with much better results to the system.

I have also used thyroid with success in major epilepsy and in petit mal in women who menstruated apparently normally, and in one or two young boys. One boy I am now treating was almost mentally ruined with bromids. He is now apparently well, having had but one major attack in several months, and the attacks of petit mal, of which he had numbers a day in spite of enormous doses of bromid, have but rarely occurred. This boy is mentally in perfect condition. Certainly any treatment that does not necessitate the use of pernicious drugs of the bromid type is a success.

One especially interesting case of toxemia is the following:

A young girl, 16 years of age, who lived about 50 miles from New Haven, and for whom physicians in all the neighboring cities had been consulted, had menstruated reguarly for a time and then ceased, and periodically once a month had an attack, starting with a severe headache, of coma or profound sleep. This had been known to last as many as five days, during which time she could hardly be aroused, though she could be made to drink water and to pass urine occasionally. After gradually coming out of this profound stupor, which lasted from three to five days, for a while she could not see, and for several days could not hear; when she began to see she did not recognize her own clothing and trinkets, and could not talk well for days. In a week she would recover and be pretty well until the next cycle. This had been going on for about eight months, the duration of the stupor and subsequent prostration gradually increasing and the amenorrhea continuing. She had never had a convulsive attack. She was then brought to me. The problem seemed to be one of periodic intoxication, and I consequently gave her thyroid. She never had another sleeping turn, but the next two months had typical convulsive epileptic attacks. From that time to this, three years, she has never had another attack, and has menstruated regularly, although after having stopped the thyroid for some weeks she was frightened by having rather severe headaches again at the menstrual period and came to me to see if she must still take the thyroid. She is now 19 years of age, and has been married a year, and seems to be perfectly well, although I believe of her own initiative she occasionally takes the thyroid.

Her mother, who was a very well woman, 42 years of age, strong and robust, had an attack of some kind of rheumatism, in which I did not see her and for which I did not treat her. At the end of this attack she had an eruption of petechiæ and hemorrhagic spots all over her lower extremities, with excruciating lumbar backache, and some blood in the urine. Knowing the daughter's history, knowing that these thyroid disturbances are hereditary, and noticing that the mother was growing stout, I gave her thyroid. The eruption rapidly disappeared, although it had been treated with many other drugs for several weeks without success. She has been well ever since.

Reasoning from this analogy of toxemia irritating the brain, and knowing of the successful use of thyroid in puerperal eclampsia, I have used it a number of times with success in uremic convulsions. One patient with acute nephritis with uremia I have seen recover and have no further convulsions after the thyroid was begun. Of course, the patient might have recovered without thyroid. In several cases of chronic nephritis with uremic convulsions I have seen the convulsions cease and remain absent until the patient finally died, after some days, the thyroid having apparently prolonged life. In these cases there were no more convulsions.

Owing to the frequent number of deaths from uremia that I have lately seen without albumin or but little albumin in the urine, some without any casts whatever at the time of the uremia, I think we are compelled to believe that there is internal secretion of the kidney which, being absent, allows uremia to take place. Whether or not water or solids in sufficient amounts are passed, whether albumin is present or absent, and whether casts are present or absent, in these cases of toxemia or uremia I am sure that thyroid does good. Of course, it can not

cure the condition, but it seems to prevent the toxemia that causes convulsions, and even wards off, for a time, the coma. I have also seen thyroid apparently aid in saving a week-old babe that had very frequent convulsions, the symptom record showing that he had had 178 in a week. The child recovered.

I think we need no better proof of the antitoxin or opponent to toxins that the thyroid secretion furnishes. We believe that nitrogen intoxication or ammonia formation has something to do with the production of uremia, and therefore thyroid must have some beneficent action in nitrogen metabolism.

It has also been found that in disturbances of thyroid in exophthalmic goiter, a vegetable diet and the withdrawal of meat are advantageous. I believe that whenever there are many nervous symptoms, headaches, vomitings, and especially if the kidneys do not do perfect work during pregnancy, that thyroid should be given in small doses as a preventive of eclampsia. If the thyroid is not furnishing increased secretion as it should during pregnancy, the mother's blood may be unable to neutralize the toxins of the double metabolism.

I believe that it would be advisable to feed thyroid in puerperal insanity, and in the insanity occurring at the menopause. Whether it would be beneficial or not, I have no data to decide.

I realize that a paper limited to twenty minutes on a subject that is so largely argumentative is hardly sufficient to bring the subject before you for discussion, but I trust I may have created at least some interest.

DISCUSSION.

DR. S. SOLIS COHEN, Philadelphia, said that he wished that he could think with Dr. Osborne that uremia is due to a failure of internal secretion on the part of the kidney. Its pathology, he feared, is much more complex. The value of thyroid substance in preventing uremia is apparently due to two factors, its destructive influence, probably indirectly exercised on nitrogenous products of a toxic nature, and its directly stimulating influence on the functionating cells, the excretory cells of the kidney. He had published some observations showing that thyroid gland administered to a normal man will increase the output both of urinary water and urinary solids, and especially of urea. Chemists declare that clinical methods can not be depended on, but they are sufficient to indicate relative values, and Dr. Cohen is satisfied that thyroid increases the output of nitrogenous substances in the urine by stimulating the essential kidney cells and by increasing nitrogenous katabolism in general. In this manner it probably destroys toxins; hence its value in uremia and epilepsy. Another therapeutic virtue of the thyroid gland which is not very well known is its value in arteriosclerosis. The cretin, the child with deficient thyroid secretion, is born an old man; the changes of myxedema are in large measure those of old age, exaggerated and caricatures; associate with these facts the diminished activity of the thyroid gland at the time that the arteries begin to degenerate, thus realizing that normal old age is concomitant with the loss of thyroid function; further, recall the antagonism between thyroid and adrenal substance and the arterial degeneration produced by adrenal poisoning and we find an exact, scientific, physiologic and evolutionary basis for the use of thyroid substance to retard the changes of premature, pathologic old age. How much of the arteriosclerosis seen is pathologic and how much physiologic is, of course, a difficult question to determine, but in many cases of arteriosclerosis coming on prematurely and even in cases in which fibroid change in the vessels comes on in the normal course of events without any special toxic factor such as syphilis, or gout, or lead, or alcohol, the use of thyroid substance will hold the process in abeyance and relieve many of the severe symptoms. Thyroid gland acts very much like an iodid combined with a nitrite. Sodium nitrite with sodium iodid will give the same pharmacologic effects, not in all respects, but in very many respects, as is obtained from the thyroid gland and, if this be remembered, he thought that very many of the uses of thyroid would be, at least empirically, accounted for. The fundamental physiologic explanation remains and depends on the work of physiologists and physiologic chemists in revealing the rôle of this very important function in the human economy.

DR. W. J. ROBINSON, New York City, said that when thyroid was first brought to the notice of the profession it was lauded extravagantly. It was to revolutionize medicine. That is a misfortune. Often when a new therapeutic measure is launched the profession think because it is good for one disease it must be good in everything. He remembered distinctly when thyroid extract was first brought into notice on account of its beneficent action in cretinism, it was claimed to have an extraordinary effect in dermatology. Some very enthusiastic physicians claimed it to be a specific in psoriasis. At present its use is very limited in dermatology. It is not used in any disease except psoriasis and in that disease it has been found no more useful than arsenic in small doses. It seems to aid in removing patches of psoriasis but does not prevent recurrences as it was believed at one time to do. There is one disease in which it has a special effect, senile eczema, probably because it improves in general the circulation and not because of any specific action on the eczema.

DR. A. C. CROFTAN, Chicago, approved of Dr. Osborne's conservative position. Aside from its wonderful effect in myxedema the action of thyroid gland is uncertain in any other disorder. The use of thyroid gland in uremia is not altogether irrational, although in a disease, or better, a syndrome of manifold origin, like uremia, with spontaneous intermissions and remissions, it is difficult to estimate the value of any therapeutic method. Uremia is more a metabolic disorder than an intoxication due to retention of urinary bodies; thyroid given by the mouth must act, if at all, through some influence it exercises on the metabolism. As it is a dead product, the administration of thyroid can only be considered a substitution therapy and its action must of necessity be transitory in character and must disappear as soon as the supply of thyroid is eliminated from the body; in any case, therefore, thyroid could only be imagined to be a palliative but not a curative agent in uremia.

Provided it is given in sufficiently large doses, thyroid extract can cause a reduction of flesh. But he believes its use to be always dangerous and generally superfluous in the reduction of obesity if the quantitative method of treating this disorder be adopted, viz., reduce the caloric intake of the patient so as to produce a caloric deficit, restrict liquids, promote free catharsis and advise abundant exercise. Thyroid extract in the beginning of a reduction cure is often of value because most obese people desire to lose flesh rapidly. If this can be accomplished, i. e., if they can lose 5 to 6 pounds during the first week, they are generally willing to follow dietetic and other restrictions for a considerable time thereafter because they have acquired confidence in the ability of the physician to really reduce flesh. This initial loss of flesh can very well be produced by thyroid, but equally as well by drink restriction. The indiscriminate use of thyroid by the laity is to be condemned as dangerous, especially in young individuals. Dr. Croftan has seen two cases of obesity in young girls who took thyroid extract to reduce flesh; they succeeded only too well in doing this and have never regained the freshness of complexion nor the youthful spirits and vigor they exhibited before. That dangerous heart seizures follow over-use of thyroid is, of course, well known.

DR. JOHN ROGERS, New York City, said that he has been surprised to find patients turn up with simple goiter who had been given thyroid tablets to do away with goiter, and who later developed exophthalmic goiter. In some cases exophthalmic goiter has been superimposed on a simple goiter and it has not disappeared with thyroid feeding. Very seldom did he see the danger of exophthalmic goiter following thyroid administration mentioned and he called attention to this danger, which he thought a real one. He had seen several cases that had a pretty straight origin in that way.

DR. A. W. BAER, Chicago, said that thyroid is too dangerous a medicament to be used indiscriminately and Dr. Osborne's

paper would occasion a little more use of thyroid than there has been in some cases in the past. Dr. Baer said that the patient who is taking thyroid extract should not know what the remedy is, so as not to have it used indiscriminately by the laity.

DR. H. P. HYNSON, Baltimore, asked a question of practical importance to the pharmacist, who is not able to standardize these products, whether Dr. Osborne observed any great difference in the products of various manufacturers of thyroid extracts, and if so, which he considers the best.

DR. WILLIAM R. WHITE, Providence, R. I., asked Dr. Osborne to give in detail the treatment, that is, in relation to food and how many times a day the thyroid extract should be administered, etc.

DR. O. T. OSBORNE, New Haven, Conn., thought the indiscriminate use of thyroid reprehensible, and large dosage dangerous. If a small dose does not do good large doses should rarely be administered. It is preferable to give the dose on an empty stomach, and have the patient chew the tablets or take an uncapped capsule between meals, with a drink of water. It is often a good plan to tell a patient to take the cap off a capsule and then take it with hot water, as the solution and absorption of any drug is more rapid so. He believes that all drugs which are being experimented with should be kept from the knowledge of the patient who is taking them. Physicians should keep a few tablets in their medicine closets and administer them—not give a prescription for thyroid to the patient to take to the pharmacist to have filled. This, he said, with all due respect to the pharmacist. In this way the effect of the remedy may be watched unbiased by the psychic effect on the patient, so that she will not say: "Oh, you are reducing my weight." As soon as it is decided that thyroid is the treatment for a given case it can be ordered. He has used the best product that he could obtain in his cases. As to specifying the particular manufacturer of thyroid, if he knows that his patients will go to the druggists who are absolutely upright, he feels that such druggists will give him the best that money will buy and he writes the Pharmacopeial title of thyroid. The more pharmacists can be depended on to buy the best and the more patients are ready to pay for the best the more satisfactory will be the result. He did not care to answer in detail the question of Dr. Hynson, but he said that he is likely to send his patients where he believed they would get the best.

SOLANIN.*

WILLIAM F. WAUGH, A.M., M.D.
CHICAGO.

Solanin is an alkaloid found in several species of *Solanaceæ*, such as *Dulcamara ferox, lycopersicum, nigrum* and *carolinense;* and especially in the young shoots of the potato and tubers that have grown while exposed to direct sunlight, and those that have sprouted. Traces have also been detected in *Scopola*. At some period in the growth of the potato the deep layers of the skin contain enough solanin to cause toxic symptoms. It is extracted by boiling water, and that in which potatoes are boiled may prove toxic. Rotting potatoes contain large quantities of solanin, and the young buds, enormous amounts.

Most instances of poisoning follow the use of the small, green, unripe tubers that have been exposed to the sun at the surface of the ground. In an epidemic described by Schmiedeburg the symptoms were headache, colic, vomiting, diarrhea, depression, mental confusion and in severe cases pallor or cyanosis, dilated pupils, short periods of unconsciousness with rapid pulse, slowing later, and in many instances a rise of temperature. All the patients recovered within ten days.

Pfuhl also witnessed many cases in soldiers who had eaten poisonous potatoes. The symptoms in 56 cases were similar, consisting of chills, fever up to 103 F., headache, violent colic, diarrhea, severe muscular prostration, sometimes nausea or vomiting and syncope, with slight jaundice. The fever subsided within three days, and all recovered. The treatment consisted of rest in bed, cold to the head and heat to the abdomen, calomel, mint and opiates. The potatoes contained six times the usual quantity of solanin. It is not stated whether they were sprouted, green or rotten. In the latter case, part of the symptoms should be attributed to ptomaines.

In fatal poisoning by the plants containing solanin, the first symptom attracting attention has been an acrid, burning sensation in the throat, followed by great restlessness, gastrointestinal irritation, muscular and fibrillary tremors, labored respiration, dryness and hyperesthesia of the skin, rapid pulse, collapse and coma, the temperature falling markedly shortly before death. The pupils are generally dilated. Albuminuria is usually present. Some of these symptoms are probably due to an accompanying principle of the atropin group.

Solanin may be prepared by expressing the juice of etiolated potato germs, adding an excess of lime-milk or of ammonia, by which solanin is precipitated. This is then separated by filtration, the insoluble part dried and exhausted by boiling alcohol, which deposits crystallized solanin on cooling (Desfosses).

DESCRIPTION.

Solanin occurs in fine silky needles, colorless, insoluble in water, slightly soluble in ether and in cold alcohol. It is a glucosid in that it splits up into glucose bodies, an alkaloid as to its basic properties, having a feeble alkaline reaction and forming salts with acids. Submitted to the action of boiling dilute mineral acids, it splits into three equivalents of glucose and an alkaloid, solanidin, whose formula is $C_{50}H_{41}NO_2$. Treated by an amalgam of sodium and water, it gives nicotine, $C_{20}H_{14}N_2$, and butyric acid, $C_8H_6O_4$. Solanin also possesses the property of forming a gelatinous mass with cold amylic alcohol, even in the proportion of 1 part to 2000. Cool amylic alcohol is its best solvent.

Spiegel gives the formula of solanin as $C_{52}H_{93}NO_{18}$ plus 4.5 H_2O. The salts are mostly amorphous, and freely soluble in water or in alcohol. They are decomposed by an excess of water, setting solanin free.

Solanin belongs to the saponine group, and hence is an energetic protoplasmic poison. A 1 per cent. watery solution prevents the development of bacteria and the coagulation of the blood, dissolving the blood elements (Perles). The lethal dose *per os* is 0.3 per kilo of body weight and about 0.1 per kilo when administered subcutaneously.

EFFECTS.

In rabbits Husemann noted from solanin a reduction of temperature of over 5 degrees Fahrenheit, with muscular tremors, spasm of the muscles of the jaw, the respiration at first rapid, later slowing, with dyspnea and a fall in cardiac energy. Tonic and clonic convulsions followed, with mydriasis and death from suffocation. The heart continued to beat after the cessation of respiration, finally stopping in diastole. He affirmed that solanin does not irritate the stomach, bowels or the subcutaneous tissues, but Perles noted after intravenous injections severe enteritis, which he attributed to the excretion of the poison into the bowels. He also found

* Read in the Section on Pharmacology and Therapeutics of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

evidences of recent parenchymatous nephritis, the urine containing hemoglobin, methemoglobin, albumin, casts and a few red blood corpuseles. In his experiments on animals he found the same appearances postmortem as after sapotoxin poisoning. The alkaloid solanin did not give rise to diarrhea, as the plants from which it is derived do, possibly because the naked alkaloid is absorbed from the stomach while the crude plant tissues pass along into the intestines. But solanin affected the kidneys more decidedly. This is confirmed by Caylus, who calls attention to the diuretic action of the alkaloid, the tetanic spasms of the thoracic muscles it sometimes causes, and the hyperesthesia of the skin. He locates its action in the cord and medulla and denies any direct influence on the brain, the stomach or the bowels.

But Brunton says that solanin in warm-blooded animals paralyses the central nervous system, without affecting the peripheral nerves or the voluntary muscles. It slows the heart and the rate of respiration, lessens sensibility, and causes death with convulsions. The temperature constantly falls. The pupil is unaffected. It produces weakness, labored breathing, nausea, vomiting, and drowsiness, but not true sleep. It does not increase the action of the bowels, skin or kidneys. Nothnagel agrees with Brunton as to the production of central paralysis, depression of heart and lungs, death from asphyxial spasm, and causing nausea and vomiting in man.

Von Schroff found doses of three grains caused yawning, dizziness, stupor, somnolence, but not sleep, tonic spasm, rapid pulse, but weak, embarrassed respiration, nausea, salivation, and extreme weakness. Solanidin differed in causing mydriasis and elevation of temperature, and this was probably present in preparations causing these symptoms.

Solanin appears to be broken up in the body, as very little is excreted in the feces or the urine (Perles).

Bocquillon-Limousin says that solanin lessens the sensibility of the respiratory mucosa, slowing respiration, and that it possesses mild narcotic properties.

BROMIDS AND SOLANIN COMPARED.

Bromid.	*Solanin.*
Motor centers depressed in brain.	Much less.
Cerebration depressed in brain.	Unaffected.
Reflex irritability depressed in cord.	Depressed more.
Sensory centers depressed in cord.	Depressed.
Respiratory centers depressed.	Depressed.
Sexual centers depressed.	No data.
Peripheral nerves unaffected.	Small doses excite; large depress.
Muscles weakened or unaffected.	Same.
Heart unaffected.	Depressed by large doses.
Skin irritated by excretion; acne.	No effect.
Temperature lowered.	Much more.
Stomach irritated.	By large doses only.
Anorexia.	By large doses only.
Salivation.	By large doses only.
Thirst.	By large doses only.
Nausea, vomiting.	By large doses only.
Fetid breath.	By large doses only.
Some diarrhea or constipation.	By large doses only.
Somnolence, no true sleep.	Same.
Cutaneous anesthesia.	Sensation raised (Caylus).
Mucous anesthesia.	None.
Impotence.	None.
Pulse slow and weak.	Less marked.
Respiration weak.	Motion and sensation lower.
Urine increased.	Same.
Respiratory secretions increased.	More; edema sometimes.
Muscular tremor.	Same.
Vitality depressed.	Not so.
Metabolism lessened.	Same.
Vascular tension relaxed.	Small doses raise, large lower.
Gastric juice decreased.	Unaffected.
Menstrual flow decreased.	No data.

While the data are incomplete and to some extent contradictory, we may see the close similarity between the effects of solanin and the bromids, as to their general depressive powers. The chief differences are that the bromids act specifically on the cerebral centers, cause acne, interfere markedly with the digestion as shown by the anorexia from all doses and fetid breath from large ones, depress the vitality, rendering the taker more liable to intercurrent infections and lowering his power of sustaining such attacks, and in all doses depress the sexual function, completely inhibiting it in full doses, reduce the sensibility of the skin and mucosa, and even in small doses relax vascular tension. Solanin acts more on the cord, less on the brain, has no action on the skin, interferes very little, if at all, with digestion, does not depress vitality or the sexual function, increases cutaneous sensibility, and increases vascular tension slightly in small doses, lowering it in large doses. Solanin depresses both motion and sensation in the respiratory area more decidedly, acting less markedly on the heart, lowers temperature far more, tends to produce respiratory and renal edema in very large doses, like rhus and cantharidin, and in small doses causes slight diuresis. It will thus be seen that in the desirable range of effect solanin admirably replaces the bromids without their most marked undesirable action. We may, therefore, look for the therapeutic field of the alkaloid to that wide one so generally occupied by the bromids.

WIDE APPLICABILITY.

Of the plants containing solanin as their active principle, dulcamara is the best known. It evidently contains others, as the effects are not identical with those of the alkaloid. Dulcamara has been recommended for scaly skin diseases, rheumatism and acute respiratory ailments, and as an aphrodisiac; for nervous erethism, hyperesthesic states and pudendal pruritus, chronic bronchitis, asthma and whooping cough; cachexias, lymphatic stases, jaundice and other cases in which the excretory passages are obstructed by débris, menstrual suppression from taking cold, cystitis, feeble capillary circulation with cold extremities, and delayed or retrocedent eruptions. *Solanus carolinense*, the horse or bull nettle, has been recommended for various nervous maladies, and has acquired a reputation as a remedy for epilepsy. Hare gave it a brief trial and reported some success. Thrush found it best suited to cases of *grand mal*, beginning subsequent to childhood, and not hereditary. Lloyd advises it, especially in cases in which the paroxysms are worst about the menstrual periods. Maxwell and Potts reported favorably on this plant as a remedy for epilepsy.

Solanin has received some attention in France and Italy. Firope recommended it for all maladies characterized by excitement, spasm or pain; while Geneuil urged it as a substitute for morphin in neuralgia, gastralgia and rheumatism, in which, however, he did not find it as reliable as morphin, which is comprehensible. It will be long before the physician will attain such proficiency in the use of any substitute for that all-powerful medicament, let alone the difficulty of obtaining a rare alkaloid in uniformly good quality. Sarda applied solanin in all diseases of the central nervous system, and Fronmueller in agrypnia, with irregular benefit. But in symptomatic and hysteric asthma and in whooping cough Clarus and Capparoni found solanin a reliable remedy, the action being direct and by reflex sedation. Capparoni found it of value in reducing morbid excitability of the spinal cord, in peripheric muscular spasms and difficulty in walking, and in tremors. De Montguyon also advised it as a substitute for morphin, having no cumulative action or congestive effect on the brain. Hughes urges solanin in the threatening pulmo-

palsy paralysis of elderly and infantile cases of capillary bronchitis, with retention of secretion, Bocquillon-Limousin employed it for cardiac asthma, whooping cough, bronchitis, all spasmodic affections, sciatica, rheumatism, gout, neuralgia, cystitis, gastric pains, dyspepsia and prurigo. Caylus advised it in respiratory spasm or irritability. Desnos employed solanin in gastralgia, painful dyspepsias and in alcoholic gastritis, with or without dilatation of the stomach; in a case of ulcerative gastritis with hematemesis, in an old gastric ulcer and in one of pyloric cancer the pains quickly disappeared under solanin. Shoemaker mentions the use of this remedy in locomotor ataxia, myalgia and the vomiting of pregnancy. Hare found it beneficial in spasmodic torticollis.

These citations suffice to show the wide applicability of solanin as an anesthetic sedative and antispasmodic; and as the dependence of pain on spasmodic conditions becomes more generally recognized the superiority of the antispasmodics to morphin will be also better comprehended and the heedless use of that dangerous resource beneficially curtailed. We would, however, call in question one of the indications for solanin given by Hughes. In large doses this alkaloid tends to produce pulmonary edema, and it lessens the sensibility of the respiratory mucosa, and hence can scarcely be indicated in a condition in which the danger lies in the low degree of sensibility that permits the collection of mucus until aëration is impaired and cyanosis results. Besides, in sanguinarin we have a remedy so admirably suited to this condition that no doubtful one is admissible.

Of great interest is solanin as a remedy for epilepsy. Employed empirically in crude preparations, it has won considerable popular and some professional favor. The comparison made between its physiologic action and that of bromids shows that solanin may be legitimately exhibited for the same purposes as the salts of bromin, while certain advantages are thereby obtained in the way of eliminating undesirable bromid effects, as well as the smaller and more easily administered doses. If we can get from a few little granules all the benefits accruing to doses of a dram or more of bromids, and escape the destruction of the functions of the stomach, the disfiguring acne, and even more serious disorders of cutaneous nutrition, a decided advance in therapeutic application will be made. Furthermore, we can not look on the grave depression of the sexual function caused by full doses of the bromids as of minor importance. Desirable as the inhibition of the sexual function may be in many cases, we must confess to a feeling that in so doing we are tampering with the essential vital principle, and striking closer to the roots of a patient's life than is warranted except when such interference is manifestly indicated. Such an indication is presented in some, possibly many, cases of epilepsy, and then it should receive due attention; but since this is not an invariable or essential feature of this malady, it is certainly an objection to the bromids that sexual depression from their use is unavoidable. It is possible, however, that some sexual depression ensues from solanin, but it can not be marked or some of the numerous observers quoted would have alluded to it; and while dulcamara alone of the solanin containing plants is accredited with sexual sedation its effects vary too widely from those of pure solanin to be ascribed to the latter alone.

As a remedy for epilepsy solanin was presented to the readers of the *Alkaloidal Clinic* in March of last year. Since that time we have received 23 reports on it. All have been favorable, excepting one, in which the alkaloid was alternated weekly with bromids, and hence can not be accepted. In children the paroxysms without exception have ceased within three weeks. The accessory treatment has been dietetic and hygienic in general, with special care in regulating the elimination; useful, but not by any means calculated to exert over epilepsy the immediate and decided control secured by the use of solanin.

DOSAGE.

The dosage of the older observers we are compelled to cast aside, as the variable quality of their solanin caused an inextricable confusion. With a chemically pure alkaloid we have found that the average adult dose is 1/12 grain, and as yet we have not found it necessary to exceed one grain *per diem*. No undesirable effects have been observed from these doses. Should an overdose be taken, the first toxic manifestation would be an acrid burning sensation in the throat, followed by oppression of respiration. The probably fatal dose is placed by Riley at six grains. Poisoning should be met by washing out the stomach, the use of strong tea or coffee, sustaining the temperature and strength by heat externally, with strychnin hypodermically in sufficient doses. The effects are quickly manifested and not very enduring, but the exact duration has not been determined. Merck suggests tannic acid as an antidote. For children the doses may be regulated in the usual manner. In all cases it is necessary to push the remedy until unmistakable constitutional effects are secured, the remedial action lying close to the limit of beginning toxic action.

CONCLUSION.

Should this remedy prove of the value indicated, the profession will owe it to Dr. M. Clayton Thrush, Philadelphia, who found the plant enjoying a popular reputation as a remedy for epilepsy among the people of West Virginia, investigated it, extracted its active principles, showed that on them the virtues of the plant depended, and applied the preparations he had made in the treatment of epileptics with success. Thus we have another evidence of the wealth of therapeutic resources yet awaiting the investigator of native American plants.

DISCUSSION.

DR. GEORGE F. BUTLER, Chicago, said that recently the superintendent of an insane asylum told him that no case of epilepsy was ever cured. As epilepsy is seen in the insane asylum, Dr. Butler considered this statement absolutely correct, but to make a broad assertion that no case of epilepsy is cured he considered a mistake. From his own experience and from information furnished by others, he is satisfied that many cases of epilepsy are cured, not only recent cases, but those which persisted for a long time as well. Much depends on the attitude of the physician who takes hold of the case. He must be an optimist, not a pessimist. If he believes that epilepsy is incurable he treats the disease according to the rules laid down in the average text-books, that is, he fills his patients full of bromids. The dulness of mentality is attributed to epilepsy when in fact it is attributable to the bromids. Dr. Butler thought that there is no more disastrous or wrong treatment than the administration of bromids for epilepsy. The untoward effects of the bromids do more harm than the epilepsy. Bromids destroy the mentality, weaken the heart, impoverish the blood, impair the sexual function and altogether make the patient very miserable and despondent. In his opinion it is time for the bromid treatment of epilepsy to be discontinued. The untoward effects of bromids will more than double the disastrous effects of epilepsy. If there is a drug that will take the place of the bromids without producing the untoward effects of the bromids he wanted it. Personally,

he had no experience with solanin, but he knew a physician in Chicago who has tried this remedy with remarkable results. Any addition to the materia medica should always be welcomed when presented by a reputable physician and it should not be belittled by any who have had no experience with it. If anything is found to be good, all right; if it is found to be not valuable, discard it. He would not give bromids. An optimistic view of epilepsy should be taken; the patient's hygiene, activity, diet, should be regulated, and an endeavor should be made to get him out of the epileptic habit. If there is any drug which will lessen the reflex irritability it should be tried. It would seem that solanin is a medicine which may take the place of the bromids with great advantage. The next case of epilepsy he has he will try solanin. From the physiologic action he anticipates some very good effects.

DR. M. CLAYTON THRUSH, Philadelphia, said he had been interested in this drug for a number of years. His attention was first called to the *Solanum carolinense* in West Virginia. He noticed that many colored people gathered berries of a certain plant and steeped them in whisky and took the decoction, receiving wonderful results in epilepsy. He investigated the drug and found it to be the *Solanum carolinense*, or horse nettle, and decided to make a complete investigation of the drug. As to its chemical composition, quantitative analyses were made of all the various parts of the plant in order to determine which part of the plant was most active therapeutically. It was found that the fruit contained the largest amount of solanin, the root was next in amount, then the leaves, and finally the stem. The alkaloids solanidin and solanin were combined in this drug by solanic acid. The solanidin was found to be present in about 7.6 per cent. the amount of the solanin, and the solanin was found to be converted by heating with a dilute acid into solanidin. Solanum contains solanidin, which is soluble in ether, and is readily detected by the proper chemical reagents. Solanin is extracted by chloroform from the alcoholic extract. It is very sparingly soluble in ether and water, freely soluble in chloroform and amylic alcohol, and also soluble in cold alcohol; more so in boiling alcohol. By heating in the presence of a diluted acid solanin is converted into solanidin and another substance capable of reducing Fehling's solution which is probably a form of glucose. Water will extract the solanin due to the presence of solanic acid. Solanin is present also in the berries of *Solanum nigrum*, in potato sprouts (*Solanum tuberosum*), in the common tomato leaves (*Solanum lycopersicum*), and in the formerly official *Solanum dulcamara;* the fluid and the solid extracts are made with a menstruum of two parts of alcohol and one part of water by the usual percolation method. This will apply to all parts except the fruit, which must be macerated. The remainder can be dried and made up as a fluid extract. The objection to the tincture is the large amount of alcohol present. As a result of pharmaceutical investigation it has been found that the fluid extract and solid extract are the best preparation of the drug. The alkaloid solanin itself can be used, with practically the same effect. Microscopic examination showed starch, tannin (calcium oxalate crystals), mucilaginous matter, resin and fixed oil in addition to the usual structural constituents. The medical properties had been well covered by Dr. Waugh. As solanin is a poison to the terminal motor plates, paralysis may be sensory and motor. By reason of this solanin is to be classed among the best analgesics. There is no danger of an accumulative action. It does not cause congestion of the brain, even in the aged. In all cases in which it is necessary to calm excitement, relieve pain or overcome spasms, it promises excellent results. It may be given with advantage in place of morphin. Dr. E. Q. Thornton has investigated the physiologic action of solanum on frogs by injecting the solid extract hypodermically into the posterior lymph spaces in doses of about 3 mg. to the gram weight of the frog. He found that the drug depresses the respiration, has little or no effect on the circulation, depresses the cerebrum and stimulates the cord. The reaction to acids is lost before tactile sense, and the same may be said of heat. In a series of investigations to ascertain its clinical value the drug has been employed in four Philadelphia hospitals, in about 25 cases of epilepsy in its various forms. In order to show the efficacy of this drug he related one instance. This girl is entirely cured, there being no symptoms since four years ago. She had the disease since 7 years of age and had been using bromids, and every time developed a profuse acne. As a result of his own experience he had reached the following conclusions: 1. That *Solanum carolinense* is of the greatest value in *grand mal* of idiopathic type without hereditary taint, when the disease has begun beyond the age of childhood. 2. It is perhaps next of greatest value in hystero-epilepsy with marked convulsive seizures. In cases of *petit mal* the drug does not seem to do the great good that has been noted in the major type of the disease. 3. In cases of well advanced epilepsy of any type in which there is degeneration of the cerebral neuron, the drug will act specifically for a time even better than the bromids, but it will finally be determined that the bromid salts will ultimately control the attacks better in these cases. 4. The foregoing clinical study has brought out sufficient evidence to warrant the statement that the inherent advantage of vegetable depresso-motors is great as compared with any mineral salt given with the same intent, since destruction of the blood corpuscles by the latter is a most detrimental feature toward lessening the resistance of the individual in a disease, in which, above all, the constitutional tonicity should be favored as ideal treatment. 5. A thorough impregnation of the nerve cells can alone be had and, therefore, cure hoped for in epilepsy in proportion as solanum is pushed to the fullest physiologic dosage and maintained through periods of months, a year not being too short a time to warrant its discontinuance. 6. The fluid extract of the drug made freshly is the ideal form of pharmaceutical preparation given in ascending doses commencing with one fluid dram and increasing to the full constitutional effect. 7. It is to be decidedly preferred to the bromids in those cases in which it can be used advantageously, because no toxic symptoms follow its free administration, and the mental faculties are not impaired by its use.

DR. WILLIAM F. WAUGH, Chicago, said that 30 years ago one of his brother officers in the navy said he thought it was a great mistake that steam had displaced the sail, that the American clipper ship was the highest type of the ship builder's art, that the world should have been contented with it and not gone further. It is perfectly natural for conservatism to hold back, but the world never stands still, and is constantly asking for something better. It is his firm conviction that if the faith of the world in drugs, which it seems to have lost so completely, is to be renewed, something better must be given than it has had. With this feeling he presented his paper on solanin, which gives certain advantages that justify the physician in giving it a trial, at least.

Clinical Notes

DIRECT TRANSFUSION OF BLOOD IN THE TREATMENT OF HEMORRHAGE.

PRELIMINARY CLINICAL NOTE.

GEORGE CRILE, M.D.
CLEVELAND, OHIO.

During the past year a series of seventy-four carefully conducted experiments on the direct transfusion of blood in the treatment of hemorrhage in animals was made by Dr. Dolley and myself, and from these experiments the following conclusions were drawn:

Arteries and veins of varying sizes may be readily anastomosed by Carrel's method so as to be impervious to blood and free from clotting; the transference of blood from one animal to another is most definitely accomplished by anastomosing the proximal end of an artery of the donor into the proximal end of the vein of the donee; convenience need be the only consideration in the selection of the vessels to be anastomosed; the

blood of one animal may be rapidly transfused to another; the blood of one dog is isontonic with that of another dog; if a dog be bled to the last drop of blood that will flow, and then an equal amount of blood be transferred from another, the transfused blood suffers no impairment by the blood or tissue of its new host, and, in turn, it causes no impairment; no hemolysins are produced; and, finally, the transfused blood becomes a perfect substitute for the lost blood, and the factor of hemorrhage may be eliminated.

After having covered by experiments every conceivable phase that would have a clinical bearing, I concluded to make a clinical test in the first case that baffled all other forms of treatment, and in which the patient apparently must otherwise inevitably die. The opportunity was presented in a case of secondary hemorrhage following nephrolithiasis, the history of which is as follows:

CASE I.—Male, 23 years old. Diagnosis, nephrolithiasis.

Operation.—Four large stones were removed from the pelvis of the kidney, where they had caused local infection and the formation of a vascular membrane about them. The wound formed in bisecting the kidney was packed with gauze. On opening the kidney there was considerable hemorrhage, but it was readily controlled then and after the operation.

Subsequent History.—On the fourth day oozing began to appear on the dressings, and there was also hematuria. This continued until the morning of the fifth day in spite of all the measures that could be employed against it, including packing, pressure, etc. By evening the condition of the patient had become alarming. The hemoglobin was reduced to 25, the red cells to 1,800,000, the pulse was 160 beats per minute and barely perceptible, the respirations 48 per minute and gasping, and the patient was unconscious. Treatment by posture, bandaging, saline infusions, stimulants, repacking, adrenalin chlorid solution, etc., was of no avail. It was clear that the terminal stage was at hand with all the resources at command exhausted. It seemed, therefore, a suitable case for transfusion, and one which would afford a crucial test of its value. A willing donor in the person of the patient's brother was at hand.

First Transfusion.—Under local anesthesia an anastomosis between the proximal end of the radial artery of the donor and the proximal end of the basilic vein of the donee was made, and the blood was allowed to flow steadily for 30 minutes. As a result the patient promptly came out of his unconscious state, the pulse and respiration fell, the blood pressure rose from 63 to 94 millimeters of mercury, the hemoglobin from 28 to 50 per cent., and the red cells from 1,800,000 to 2,900,000. In the donor the hemoglobin fell from 100 to 70 per cent. and the red cells from 5,500,000 to 4,600,000 per cubic millimeter.

The patient was then in such good condition that the original plan of doing a nephrectomy was followed, using ether as the anesthetic. The operation was well borne in spite of difficulties in removing the kidney, which will not be here mentioned.

The following morning the condition of the patient was unsatisfactory on account of decomposing blood clots filling the bladder. Under cocain I then made a suprapubic cystotomy, washing out a large quantity of foul smelling urine, and removing quantities of infected blood clots. During the day following this there was total suppression of urine and marked uremia. This was overcome during the following night, and the next day he was better. Improvement continued for two weeks, when the larger part of the lumbar wound was healed. A severe cystitis continued. Then, without warning, a profuse hemorrhage set in from the bladder and continued for two days in spite of all treatment. The red cells again fell to 1,900,000 and the hemoglobin to 25 per cent. The pulse rose to 130, and his condition was critical.

Second Transfusion.—This time another brother served as donor. The patient's condition immediately improved again, the red count reaching 3,000,000, and the hemoglobin 54 per cent. The granulations in the remainder of the lumbar wound had been pale and inactive, but the next day they were red and healthy. No further hemorrhage occurred, and from this time on the red count rose until it reached 4,800,000. He was discharged from the hospital as cured on the twenty-fifth day after the second transfusion. He has now resumed his work and shows 6,400,000 red cells.

Two patients with typhoid hemorrhages received transfusion, one was in extremis and the other one very low. Both were wonderfully revived by the transfusion. One was dying at the time, but became entirely conscious and rational and held his improvement until further hemorrhage proved fatal on the following day. The other patient survived further hemorrhages, but died later with a double parotitis and typhoid. Under similar circumstances I should suture the typhoid ulcers, as the patients after the transfusion were good surgical typhoid risks.

The fifth transfusion was for a secondary renal hemorrhage following nephrolithotomy. The patient was very poorly nourished and a poor risk. The hematuria continued for thirteen days, and finally his red count was reduced to 1,800,000, hemoglobin to 28 per cent., and he had been delirious for two days. We then performed transfusion in a similar manner to the preceding. As the fresh blood flowed into his vessels his delirium gradually lessened, and while on the table and during the transfusion entirely disappeared. The lumbar wounds healed, but an abdominal wound made for exploratory purposes, although resutured twice, never showed a sign of repair, finally ending in peritonitis and death. The blood count, without any further treatment, however, was maintained to the end.

The last case was that of a woman who had been bleeding from the bowels for four months, and during that time had been under medical treatment. Her secondary anemia was extreme; the hemoglobin was approximately 12 per cent., red cells 1,200,000. She was in such a low state that it was not safe even to anesthetize, and was brought in for the purpose of making a transfusion. The transformation in this case was extraordinary. The lemon-yellow color was replaced by white, then by pink, the lips became red, the blood count was more than doubled and the hemoglobin trebled. She felt invigorated and stimulated. All other treatment was withdrawn and her hemorrhage ceased. Three weeks later a little blood was noticed at stool. She was then anesthetized and thoroughly examined, when it was found there was marked varicosity in the rectum with some small ulcers. These were sutured over and the patient left the hospital at the end of six weeks with a red blood count of 4,000,000 and hemoglobin of 70. Before the transfusion she had no appetite and could scarcely be made to take nourishment. Directly after the transfusion she had a very vigorous appetite and gained rapidly in health and strength. Her red cells rose to 2,500,000 (more than doubled) and hemoglobin to 40.

We have complete tables of observations in each case on the red blood count, the hemoglobin, and the blood pressure of both the donor and donee, and records of urinary examinations in the donee, extending over a period of time. These tables will be included in the complete publication. Six clinical transfusions have been done. The donors in each instance regained the blood lost in from five to seven days. They had been

kept from their work only the day of the transfusion. All showed the usual temporary effect of the bleeding, no agglutinins, no hemolysins.

The donee showed neither nephritis nor hemoglobinuria, no laking of blood, and no evidence that the new blood had in any way unfavorably affected the donee, nor that the donee had unfavorably affected the newly transfused blood. In other words, the conclusions reached in the laboratory were wholly realized in the clinic.

The occurrence of spontaneous cessation of hemorrhage in two of the cases—each of which was pathologic—suggests strongly this method of treatment for cholemic, hemophillic and other forms of pathologic hemorrhage.

Since the healthy blood of one individual is apparently physiologically interchangeable with that of another, if the blood lost by one is replaced by an equal quantity from another, the factor of hemorrhage may by direct transfusion be eliminated.

The transformation in these cases has been unequaled in my surgical experience, except in the relief from asphyxia by intubation.

TWO ATYPICAL CASES OF SMALLPOX.

SAMUEL E. EARP, M.S., M.D.

Professor of Practice of Medicine, State College of Physicians and Surgeons; Consultant in Practice of Medicine, St. Vincent's Hospital and Protestant Deaconess' Hospital; Lecturer on Medicine and Dietetics, St. Vincent's Training School for Nurses, and Visiting Physician in Practice of Medicine, Indianapolis City Hospital.

INDIANAPOLIS.

CASE 1.—*History.*—On April 1, 1905, I saw J. H. at the Indianapolis City Hospital, who had been sent there on the previous day with (alleged) typhoid fever. There was no history of syphilis and the patient had had the infectious diseases of childhood. He had been vaccinated six years ago. The patient had been a moderate drinker of alcoholic stimulants. His present sickness commenced with a general malaise and occasional chilly sensations. There was no pain, appetite was good, bowels were constipated, and there was some slight fever.

Examination.—I found the skin dry, face slightly flushed, and a few papules which, in their incipiency, a few days previous to admission to the hospital, had been designated as the rose-colored spots of typhoid fever. There was a slight elevation of temperature. Tongue was heavily coated, abdomen slightly tender, and palpation of the chest gave negative results. This was true in percussion also, except a dulness over the left lobe. Heart was regular and sounds were clear. On the second day, which was the first day I saw him, there were a few fine papules on the face which some had suggested might be acne vulgaris, since the patient had had this disease since childhood. There was an occasional papule on the chest and abdomen, but no indication of induration, unless it was an isolated one on the chest, which possibly gave the appearance of an incipient umbilication.

Diagnosis.—Dr. J. M. Wallace, the interne, and myself, made a provisional diagnosis of smallpox, although the evidence was not strong. The patient was quarantined. On the second day the spots on the chest, face and abdomen were more numerous, but with little induration. The temperature was normal. On the fourth day vesicles were well formed on the face and an occasional pustule. On the fifth day the disease was well developed, but very mild indeed, and one in which mistaken diagnosis could easily have been made.

Patient was discharged from the smallpox hospital April 21.

CASE 2.—*History.*—J. R., colored, aged 60 years, was admitted to the Indianapolis City Hospital, March 30, 1905, with ascites, pulmonary edema and dyspnea as a result of myocarditis and chronic nephritis. The legs were edematous. The patient responded promptly to treatment and gave every evidence of having recovered April 1, with the exception of an occasional attack of dyspnea when doing chores at the hospital. These, however, were infrequent, and did not interfere with his duties as assistant. April 3, together with all patients, he was vaccinated on account of appearance of Case 1 in the ward, but it was unsuccessful.

Course of Disease.—April 17 he complained of not feeling well, seemed to talk irrationally, and had a subnormal temperature. April 18 I found the patient had left his bed and was sitting in a chair at a remote portion of the ward, with signs of collapse, pulse imperceptible. Following the hypodermic injection of digitalin and strychnia, his condition slightly improved. On the following day there was no change. April 20 my attention was called to a roughness on his forehead, and on close examination the same condition was present on the back, chest and abdomen. On the following day, on some portions of the body there were papules, others felt like bird-shot, and several pustules were on the abdomen and chest. In two locations on the abdomen several of the pustules seemed to coalesce and form a large one. At no time did the patient's temperature reach normal. The different stages were present on the same person and at the same time.

Diagnosis.—Diagnosis of smallpox was made, and although there was some little doubt in the case he was removed to the contagious pavilion. Three days the development of the eruption was sufficiently pathognomonic to confirm the provisional diagnosis. The case was seen by Drs. C. E. Fergerson, A. W. Brayton, Paul Martin and J. M. Wallace.

Some of the irregularities of the case will be recognized as follows: Pre-eruptive stage imperfect, absence of the gradual appearance of eruption, various stages of eruption at the same time, resembling varicella somewhat, the eruptions in some localities possessing the characteristic histologic formation, while in others the vesicles were inclined to be unilocular rather than multilocular, and the variation of temperature in the one case and subnormal in the other. The unusual features in these cases, especially in the last one, will be easily recognized, and, therefore, comment is unnecessary.

FATAL POISONING BY THE EXTERNAL APPLICATION OF BICHLORID OF MERCURY.

G. G. CRAIG, M.D.

ROCK ISLAND, ILL.

Patient.—I was called July 11, 1906, to see a young woman, aged 25, who had applied wood alcohol to her neck, back and left arm for rheumatism.

Examination.—She was hysterical, and said that the burning from the application was intolerable. The parts were very much reddened and inflamed, presenting the appearance of an ordinary scald or burn. I gave her a hypodermic injection of morphin and prescribed a local application of saturated solution of bicarbonate of soda. The next morning I was informed that the wood alcohol contained a large quantity of bichlorid of mercury.

Course of Treatment.—The patient passed an uncomfortable night. She complained of a burning sensation in her mouth, some vomiting, and a slight diarrhea. The back of the neck, the whole back down to the waist, and the left arm were thoroughly burned, and had become largely covered with blisters during the night. I treated the local injury as an ordinary burn, with a solution of bicarbonate of soda, punctured the edges of the blisters, preserved as much as possible the blistered skin for a dressing, and applied stearate of zinc. The burn improved nicely. She was nourished by white of egg and milk exclusively. The inflammation of the mouth, throat, stomach and bowels steadily increased and she died on the morning of July

17, a little over five and one-half days after the accident. At death the tongue was nearly double its normal size, and of a brownish color. It looked like cooked beef, and during the night before death the bowels were moving constantly.

Remarks.—The application used was what is commonly known as "dead-shot;" the wood alcohol and the bichlorid of mercury had been purchased separately, and the mercury had been added by the purchaser, hence the label on the bottle was simply wood alcohol, although it also had a skull and cross bones, and a "poison" label on it. The preparation was in a little medicine case in the toilet room and was supposed to have been locked up, but evidently was not. The young woman saw it, thought it would be good for her rheumatism, and had a friend apply it.

Some years ago I had a case of poisoning by arsenic, which presented almost the same symptoms. It was taken by the mouth by a very dissipated middle-aged woman, with suicidal intent. She survived the first shock, but died five or six days later from exhaustion caused by inflammation of the alimentary canal.

I know of no physiologic antidote for poisoning by corrosive sublimate. I relied wholly on giving the patient all the albumin she could take, hoping each day that the poison would become neutralized, and that the patient would recover. In that, however, I was doomed to disappointment. There was not the slightest indication that the poison was losing its power.

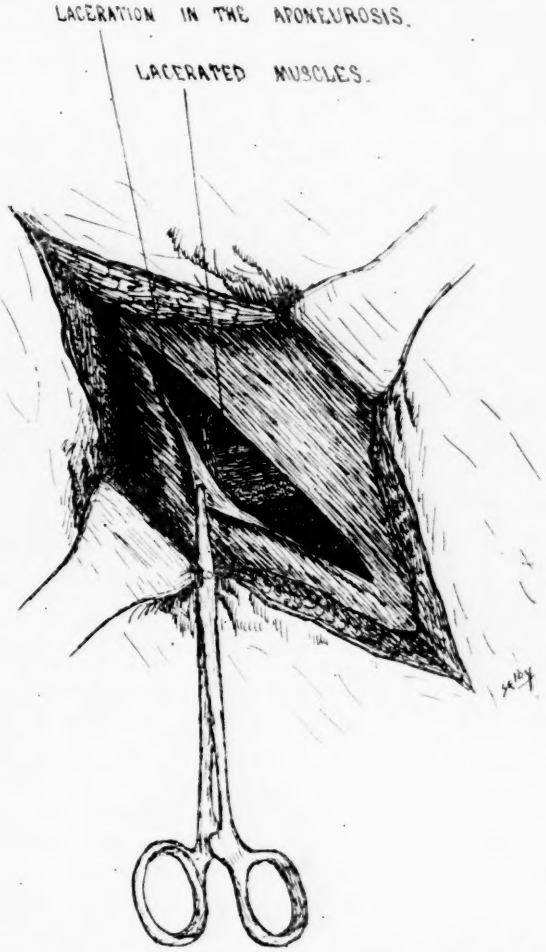
[EDITOR'S NOTE.—There are numerous cases[1] of poisoning from the external application of mercurial compounds. Generally the poison has been corrosive sublimate and has been applied in the form of ointment or as an alcoholic solution. Watery solutions, however, may be absorbed. Even black wash externally applied has produced salivation. The symptoms of mercurial poisoning after absorption through the skin are almost identical with those produced by the poison when swallowed. The irritation, inflammation and ulceration of the stomach and intestines are very prominent. There is good reason to believe that the stomach and intestines act as eliminating organs in these cases as in poisoning by other substances. No clear plan of treatment has been laid down by authors on toxicology for cases of poisoning by external application. The usual antidote for corrosive sublimate is albumin in some form which unites with the mercury to produce an insoluble albuminate. This albuminate, however, is soluble in an excess of albumin and hence the administration of albumin as an antidote should be followed by an emetic or by lavage of the stomach to get rid of the mercury which has been rendered insoluble before it can be reabsorbed in consequence of becoming soluble in an excess of the antidote. In case of absorption from an external surface, it is possible that the mercury escapes from the system in the gastric and intestinal mucus, in which case probably the use of albumin would be superfluous, if not contraindicated. Whether or not another antidote might be used is uncertain; it would seem as if a trial of some sulphid might be desirable. In regard to the external wound, probably nothing better could have been done than was done by Dr. Craig, as the bicarbonate of sodium tends to produce an insoluble basic carbonate of mercury which would not so readily penetrate the skin. But it is probable that in this case the poison had been absorbed before any application was made. Aside from the attempt to produce an insoluble compound of mercury in the intestinal canal, there is no special treatment for poisoning by mercury. Elimination should be encouraged by copious introduction of liquids, possibly better by enteroclysis or hypodermic injection of saline solutions; proper stimulants should be given, and the particular symptoms treated as they arise.]

1. See Taylor's Medical Jurisprudence": also Blyth, A. W.: "Poisns, Effects and Detection"; Sachur: Berlin. Wochchr., 1892; and Meeres: Lancet, Sept. 16, 1871.

DIRECT ABDOMINAL HERNIA OF TRAUMATIC ORIGIN.

CLARENCE D. SELBY, M.D.
TOLEDO, OHIO.

This case is interesting, perhaps more in its origin than in the lesion produced, though none the less instructive.



Patient.—A man, aged 32, laborer, was employed with a wheelbarrow on a scaffolding six feet from the ground, when a misstep caused him to fall, the wheelbarrow following and the handle striking him in the right iliac region.

Examination.—When first seen, a short time later, there was a soft hemispherical mass, 6 cm. in elevation and 8 cm. in diameter, in the region of the injury, with but slight abrasion and no discoloration of the overlying skin. Extreme pain prohibited manipulation, but as the diagnosis was apparent the man was sent to the hospital. There, when placed in a recumbent posture, the mass receded, and a hiatus could be felt in the supporting structures of the abdominal wall. In fact, the margin of the lacerated aponeurosis was plainly palpable.

Operation.—Under ether anesthesia an incision was made parallel to Poupart's ligament over the break in the wall, which was 4 cm. above the ligament. The ruptured aponeurosis was evident. The break was clean cut as though produced by a knife, following, of course, the fiber of the tissue. The internal oblique and the transversalis beneath were torn away

from their points of origin on the iliac crest and crural arch, producing a triangular laceration with the apex toward the anterior superior spinous process. The peritoneum was intact. Thus, in the words of the text-book, the coverings of this hernia were integument and peritoneum.

Recovery was perfectly satisfactory and the man returned to work in three weeks.

This man at first refused operation. Of course it is apparent what the result would have been had he not consented.

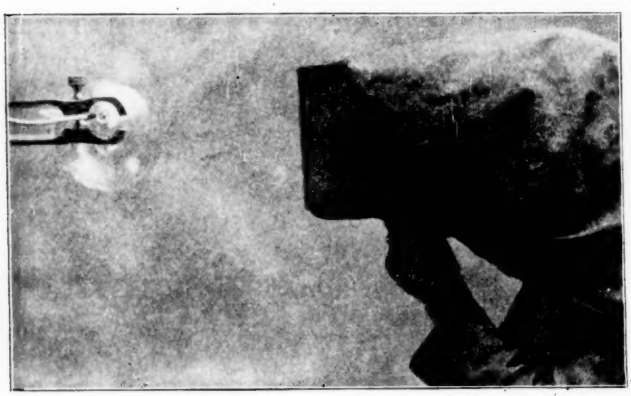
Perhaps the most instructive feature of this case is the fact that the muscles and fascia, the most rigid structures in the wall, gave way, while the integument and peritoneum, the elastic tissues, were unharmed.

502 Main Street.

SUBSTITUTE FOR DARK ROOM DURING FLUOROSCOPIC EXAMINATIONS.

GEORGE W. KING, M.D.
HELENA, MONT.

Physicians who use the fluoroscope only occasionally do not find it convenient to equip a dark room for the purpose and are consequently at a disadvantage when working by daylight. To obviate the necessity of heavily screening windows and



other avenues of light, a hood can be easily improvised which serves the purpose admirably. A sheet of rubber lead composition is chosen by preference, for it serves also as a protection to the operator. If the latter is not at hand, several layers of newspapers enfolded in a suitable piece of black muslin and fastened to the fluoroscope will effectually shut out the light. So arranged, the observer is in absolute darkness and can see only the image reflected on the fluoroscopic screen.

DIPHTHERIA ANTITOXIN IN THE TREATMENT OF EXOPHTHALMIC GOITER.

ADRIAN F. BURKARD, M.D.
OMAHA.

The symposium on "Exophthalmic Goiter"[1] reminds me of a short report[2] under the same heading as my note, written by Dr. Robert T. Legge, of McCloud, Cal. The doctor reported several cases of the above disease, in which he had used diphtheria antitoxin with curative results.

Prompted by his report, I lately used the same antitoxin for the same disease, and also with very satisfactory results. For, though only about five weeks have elapsed since the injection (of 3,000 units), already the tumor has almost disappeared, the circumference of the neck having diminished almost one and one-half inches. The pulse rate has fallen from 135 to 80; the tremor, before injection very marked, is now almost imperceptible; the exophthalmos can no longer be detected; the nervousness and weakness have almost disappeared. There have been no untoward effects whatever. No other treatment has been used except local inunction with ointment of red oxid of mercury, which before injection had no effect. When I reported this case to our local medical society lately four other cases of the same treatment were reported. In three of these the results were good or excellent; in one no marked results were reported after several injections.

Of course, one case, or a dozen cases, are of very little value. But I make this report principally in the hope that other physicians, who may have used the same treatment, may be prompted to report. Thus the collective testimony of many may be of value. Or probably Dr. Legge may have used the antitoxin since, in which case a word from him would surely be of interest.

1902 South Seventeenth Street.

1. THE JOURNAL A. M. A., Sept. 1, 1906.
2. THE JOURNAL A. M. A., April 22, 1905.

STRIKING IDIOSYNCRASY TO THE USE OF COCAIN IN THE EYE.

T. W. MOORE, M.D.
HUNTINGTON, W. VA.

The patient here referred to has an idiosyncrasy for two drugs, quinin and cocain. Such susceptibility to quinin has been frequently reported, and I have seen several cases so afflicted, but I am not aware of any one being affected by cocain in this manner, and a cursory examination of the literature fails to reveal a similar case.

During January, in testing the refraction of L. L., a bank clerk, aged 25, I had a nurse in the office instil a solution of homatropin, gr. ½, in ½ dram of 4 per cent. solution of cocain, one drop in each eye, repeated every five minutes until six drops were used. Just before using the last drop the nurse called my attention to the fact that the patient's eyes had become very much swollen. To my astonishment I found the lids so swollen that it was only after the greatest effort that the patient could separate them at all. There was considerable chemosis and redness, the cornea appearing sunken. Hot fomentations, continued for half an hour, reduced the swelling enough for the patient to go home on a car, but it had not disappeared sufficiently for him to resume his duties the next morning, fifteen hours after the first instillation.

I was extremely puzzled as to the cause of this until about six months afterward when this patient came to me with a foreign body in one eye. I used one drop of 4 per cent. solution of cocain and the patient exclaimed immediately: "That is the medicine that swelled my eyes," and in five minutes the swelling of lids and conjunctiva was very apparent and in half an hour (nothing being used to counteract the action of the cocain), the palpebral fissure had become a narrow slit. This subsided almost entirely before morning, the patient having applied hot fomentations for half an hour that evening.

This young man has considerable nasal obstruction, both the inferior and middle turbinates being almost in contact with the septum when he is free from a cold (which he rarely is) and when suffering from an acute exacerbation of his rhinitis his eyes are red. He tells me that he is very susceptible to the influence of quinin, his body becoming nearly covered in a very short time with giant hives with great swelling, from so small a dose as 2 grains.

New and Non-Official Remedies

THE FOLLOWING ARTICLES HAVE BEEN TENTATIVELY ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR INCLUSION IN THE PROPOSED ANNUAL, "NEW AND NON-OFFICIAL REMEDIES." THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT, BUT TO SOME EXTENT ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE FINAL ACCEPTANCE AND PUBLICATION IN BOOK FORM.

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT SO FAR AS KNOWN IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

(*Continued from page 1379.*)

IODIPIN 25 PER CENT.

IODIZED SESAME OIL, TWENTY-FIVE PER CENT. IODINE.

A preparation similar to the preceding, but intended for hypodermic administration.

Dosage.—2 to 6 Cc. (30 to 90 minims) by hypodermic injection. This article is also marketed in the form of capsules, each containing 2 Gm. of iodipin 25 per cent.

Prepared by E. Merck, Darmstadt. (E. Merck & Co., New York).

IODOFORMOGEN.

IODOFORMALBUMIN. IODOFORM ALBUMINATE.

A nearly odorless mixture of iodoform and albumin.

It is prepared by precipitating a solution of albumin with alcoholic solution of iodoform and heating the precipitate at 120° C. (248° F.).

It is a very fine, voluminous, light-yellow, nearly odorless powder, non-hygroscopic and non-conglutinating. It is insoluble in water, and sterilizable at 100° Co. (212° F.) without decomposition or change.

Actions and Uses.—Its action is that of iodoform, which is slowly liberated in connection with wound surfaces, making the action more peristent. It limits secretion, favors granulation and promotes drying.

Iodoformogen is recommended as a dusting powder for ulcerated surfaces.

Dosage.—Being about three times as voluminous as iodoform, it is usually applied undiluted to the affected parts. It may be used as a snuff in ozena, mixed with an equal amount of boric acid.

Manufactured by Knoll & Co., Ludwighafen a. R. and New York. German patent No. 95,580. U. S. trademark No. 31,186.

IODOTHYRINE.

THYROIODINE.

Iodothyrine is a milk sugar trituration of the active principle of thyroid gland, 1 Gm. representing 1 Gm. of fresh gland and containing 0.0003 Gm. of iodine.

According to the patent specifications iodothyrine may be obtained by boiling the fresh thyroid glands, freed from fat, with dilute sulphuric acid, cooling the liquid and collecting the body which separates, dissolving the active portion in alcohol and evaporating to dryness. The product is further purified by washing with ether which dissolves impurities. One part of the active ingredient is mixed with 309 parts of sugar of milk.

It is a white or yellowish white powder, having the sweet taste of milk sugar.

Actions and Uses.—It is similar in action to Glandulæ Thyroideæ Siccæ, U. S. P., but it is claimed to possess the advantage of more definite strength and absence of decomposable extraneous matter.

Dosage.—Adults, 0.6 to 2 Gm. (10 to 30 grains); children, 0.3 to 1 Gm. (5 to 15 grains) per day.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Continental Color & Chemical Co., New York). E. Merck, Darmstadt (Merck & Co., New York). U. S. patent No. 686,648. U. S. trademark No. 29,406.

ISOFORM POWDER.

Isoform powder is a mixture of para-iodoxy-anisol, $C_6H_4(OCH_3)(IO_2)1:4 = C_7H_7O_3I$, an iodoxy-derivative of anisol, with an equal weight of calcium phosphate.

Para-iodoxy-anisol is prepared by the oxidation of iodo-anisol, $C_6H_4(OCH_3)(I)1:4$, with chlorine or hypochlorites.

Para iodoxy-anisol is a colorless powder, having a slight anise-like odor. It is difficultly soluble in water, and practically insoluble in alcohol and ether. It may be heated in a dry state to about 200° C. (392° F.) without decomposition. It contains 47.74 per cent. of iodine. It liberates iodine from a solution of potassium iodide and acetic acid. It is liable to explode if heated or when triturated. Hence it is marketed in a mixture with an equal weight of calcium phosphate which is designated "isoform powder."

It is incompatible with acids and with reducing agents such as iodides and with the substances generally which are incompatible with iodides.

Actions and Uses.—It is a germicide and antiseptic in consequence of its oxidizing power and, in contradistinction to iodoform, it acts not only in a medium free from oxygen, but in conjunction with free access of air. It is claimed to be non-toxic in comparatively large doses and to be absolutely non-irritant to the unbroken skin. It is recommended as a substitute for iodoform.

Dosage.—Internally, 0.65 to 2 Gm. (10 to 30 grains) per day. It is used externally as a dusting powder, as a paste with glycerin, as ointments, suspensions in glycerin, gauzes, etc., in strength varying up to 10 per cent. of pure isoform.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M. (Victor Koechl & Co., New York). U. S. patent No. 777,962.

ISOPRAL.

TRICHLOR-ISOPROPYL ALCOHOL.

Isopral, $CCl_3.CHOH.CH_3 = C_3H_5OCl_3$, is 1,1,1-trichlor-2-propanol.

It is obtained by reaction of chloral with magnesium-methyl iodide and decomposition of the compound formed.

It forms handsome prismatic crystals, having a camphoraceous odor and an aromatic, somewhat pungent taste, producing a burning sensation on the tongue, followed by decided anesthesia. It melts at 49° C. (120.2° F.), but volatilizes very readily at the ordinary temperature, forming sublimates similar to camphor. It is soluble in 35 parts of water, but more readily soluble in alcohol and ether.

It is distinguished from chloral hydrate by not developing the odor of chloroform when its aqueous solution is warmed with alkali hydroxides.

It should not be exposed to heat and air.

Actions and Uses.—Isopral resembles chloral in its action, but is effective in smaller dose. It is prompt in effect and apparently devoid of cumulative action. It has some degree of local anesthetic power. It may be used as a substitute for chloral hydrate and is serviceable as an alternative in cases in which it is necessary to give hypnotics for a long time.

Dosage.—0.3, 0.6 to 1 Gm. (5, 10 to 15 grains) in capsules or wafers which should be dispensed in a well-stoppered glass vial.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Continental Color & Chemical Co., New York). U. S. patent No. 742,430. German patent No. 151,545. U. S. trademark No. 41,157.

KASAGRA.

FLUIDEXTRACTUM CASCARA SAGRADA AROMATICUM, STEARNS.

A fluidextract said to conform in drug strength to the requirements of the U. S. Pharmacopeia for fluidextracts. It is prepared with especial care, the drug being extracted with a menstruum containing no alcohol. The preparation is said to contain 0.05 per cent. of alcohol.

Actions and Uses.—Kasagra is recommended as an especially palatable preparation of cascara, owing its laxative effects to this drug alone.

Dosage.—1 to 2 Cc. (15 to 30 minims) four times a day, half an hour before meals and at bedtime.

Prepared by F. Stearns & Co., Detroit, Mich. U. S. trademark No. 53,076.

KOLA, STEARNS.

FLUIDEXTRACTUM KOLÆ, STEARNS.

Each 30 Cc. (1 fluidounce) is said to represent 31 Gm. (480 grains) of fresh kola nut. It contains 23.5 per cent. of alcohol.

Action and Uses.—Kola seeds contain from 1.5 to 3.6 per cent. of total alkaloids of which from 1/100 to 1/40 is theobromine and the rest is caffeine. About one-half of the caffeine is combined as kolatannate of caffeine. The actions and uses of the remedy are essentially the same as those of caffeine. It is probable that the kolatannate is not so active as free caffeine.

Dosage.—2 to 4 Cc. (½ to 1 fluidram) three times a day.

Prepared by Frederick Stearns & Co., Detroit, Mich.

KRESAMINE.

ETHYLENE-DIAMINE TRICRESOL.

A clear watery solution of 25 per cent. of trikresol (which see) and 25 per cent. of ethylene-diamine.

It is a clear, colorless liquid, miscible in all proportions with glycerin, and soluble to the extent of 33 per cent. in water, but insoluble in petrolatum.

Actions and Uses.—Kresamine is a powerful bactericide, with a claimed minimum of toxicity. It is said that the bactericidal effect of the cresol and its power of penetrating the animal tissues are greatly enhanced by the presence of ethylene-diamine and it is claimed to be far less irritating when used as a wet dressing than other antiseptics. It is useful in all cases where an active bactericide is required and particularly when the microbes are in an albuminous menstruum. The preparation is not so dangerous as carbolic acid. It has been recommended for the treatment of ulcers, eczema, lupus and other skin affections.

Dosage.—It is used only in dilutions (2 to 25) containing 2 per cent. or less of each of its active constituents.

Kresamine may be applied in the form of ointment.

A dilution containing 2 per cent. of each ingredient was formerly marketed under the name "Ethylene-diamine Trikresol Solution." This was used without dilution.

Prepared by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin (Schering & Glatz, New York). German patent No. 74,634. 74,634.

LAC BISMO.

MISTURA BISMUTHI, HART.

A mixture said to consist of bismuth hydroxide and bismuth subcarbonate, suspended in water, in a finely divided state, and containing 0.16 Gm. (2½ grains) of the salts in 4 C.c. (1 fluidram.

Dosage.—4 to 16 Cc. (1 to 4 fluidrams) as directed.

Prepared by E. J. Hart & Co., Ltd., New Orleans, La. U. S. trademark.

LACTOPHENIN.

LACTYL-P-PHENETIDINE. LACTPHENETIDINE. PARA-LACTYL-PHENETIDINE.

Lactophenin, $C_6H_4(OC_2H_5)(NH.CH_3.CHOH.CO) = C_{11}H_{15}NO_3$, is a compound differing from acetphenetidin (phenacetin) in that the acetic acid group, is replaced by the lactic acid group, $(CH_3.CHOH.CO)$.

It is prepared by heating lactic acid and p-phenetidin, in molecular proportions, at 180° C. (356° F.), until all the liberated water is expelled, and crystallizing the product from hot water.

It occurs in small, colorless crystals or as a white powder, melting at 117° to 118° C. (242.6° to 244.4° F.), odoriess and slightly bitter. It is soluble in 330 parts of cold water, in 55 parts of boiling water and in 8.5 parts of alcohol, producing neutral solutions.

If 0.1 Gm. is boiled for a minute with 1 Cc. of concentrated hydrochloric acid, then diluted with 10 Cc. of water and filtered, the addition of 3 drops of a 3 per cent. solution of chromic acid to the cooled filtrate gradually develops a ruby-red color. If 0.1 Gm. of lactophenin is boiled with 10 Cc. of water and the solution filtered after cooling, the filtrate turns turbid on the addition of bromine water. After hydrolysis with concentrated hydrochloric acid, lactophenin gives the indophenol reaction with phenol and chlorinated lime. Any slight residue which may be obtained by incinerating lactophenin should not, after solution in dilute hydrochloric acid, give a reaction with hydrogen sulphate.

Its incompatibilities are the same as those of acetphenetidin (phenacetin).

Actions and Uses.—The effects of lactophenin are similar to those of acetphenetidin (phenacetin), over which is possesses the advantage of greater solubility in water.

Dosage.—0.5 to 1 Gm. (8 to 15 grains), in wafers or capsules.

Manufactured by Chem. Fabrik, vorm. Goldenberg, Geromont & Co. German patents Nos. 70,250 and 90,595.

LAMINOIDS FERRUGINOUS (NASCENT).

Each tablet contains iron sulphate and sodium bicarbonate in quantities equivalent to those of pilulæ ferri carbonatis (Blaud's pills), but the two salts are separated into two layers so that the formation of ferrous carbonate will occur only when the tablets are moistened. An excess of bicarbonate is present to neutralize the acid in the stomach.

Dosage.—The same as Blaud's pills.

Prepared by Schieffelin & Co., New York. U. S. trademark No. 38,384.

LENNIGALLOL.

PYROGALLOL TRIACETATE. TRIACETYLPYROGALLOL.

Lennigallol, $C_6H_3(CH_3CO_2)_3 = C_{12}H_{12}O_6$, is triacetylpyrogallol obtained by replacing the hydroxyl groups of pyrogallol with acetyl groups.

It is prepared by boiling 10 parts of pyrogallol, 1 part of sodium acetate, and 25 parts of acetic anhydride for 2 hours, and washing the crystalline product on a filter with water.

It is a white, crystalline powder, melting at 165° C. (329° F.). It is insoluble in water, but soluble with decomposition in warm aqueous alkalies.

It is incompatible with alkalies, strong acids and oxidizing agents.

Actions and Uses.—Lennigallol is said to be non-poisonous and non-irritating, but a mild and painless corrosive.

It is introduced as a substitute for pyrogallol in psoriasis, lupus, acute and subacute eczema of children and other skin diseases.

Dosage.—In 5 to 10 per cent. ointment with zinc oxide.

Manufactured by Knoll & Co., Ludwigshafen a. Rh. German pat. No. 105,240.

LIQUOR TRITICI.

LIQUOR TRITICI CONCENTRATUS.

A solution of which each Cc. (15 minims) is said to represent 1.75 Gm. (27 grains) of triticum repens in a menstruum containing 23.5 per cent. of alcohol.

It is made by exhausting the drug with water, concentrating the percolate *in vacuo*, and preserving the product by the addition of 23.5 per cent. of alcohol.

Dosage.—4 Cc. to 16 Cc. (1 to 4 fluidrams) at intervals of from two to four hours.

Prepared by Parke, Davis & Co., Detroit, Mich.

LITHIUM ICHTHYOL.

A lithium derivative of ichthyol.

It is a dark brown mass, somewhat more consistent, but otherwise resembling ammonium ichthyol in appearance

Actions and Uses.—It is an antiseptic and bactericide. It is recommended as a wound antiseptic and in syphilis.

Manufactured by the Ichthyol Co., Hamburg (Merck & Co., New York).

LYCETOL.

Lycetol, $NH\begin{matrix}\diagup CH(CH_3).CH_2 \diagdown \\ \diagdown CH_2.CH(CH_3) \diagup\end{matrix}NH.COOH.CHOH.CHOH.COOH = C_{10}H_{20}O_6N_2$, is a tartrate of a methyl derivative of diethylenediamine (piperazine).

It is prepared by the distillation of glycerin with ammonium chloride or bromide, reduction of the dimethylpyrazine (isolated from the distillation products) with metallic sodium and converting the base so obtained, after purification, into the tartrate.

It is a white, odorless powder, melting at 250° C. (482° F.) anhydrous, but slightly hygroscopic. It is easily soluble in water, forming agreeably acidulous solutions.

It is incompatible with alkalies which liberate the insoluble free base.

Actions and Uses.—Lycetol is claimed to be a serviceable diuretic and uric acid solvent. It is said to be free from disturbing effects on the stomach and to be well tolerated for long periods.

Dosage.—1 to 2 Gm. (15 to 30 grains), well diluted, and preferably in carbonated water, sweetened with sugar if desired.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Continental Color & Chemical Co., New York). U. S. patent No. 523,018. U. S. trademark No. 24,722.

LYSIDIN.

ETHYLENE-ETHENYLAMIDINE. METHYLGLYOXALIDIN. AETHYLENETHENYLDIAMIN.

Lysidin, $\begin{matrix} CH_2.\ N: \\ | \qquad\quad \\ CH_2.NH. \end{matrix} C.CH_3 = C_4H_8N_2$, is a monatomic base derived from ethylene diamine.

It is prepared by subjecting ethylenediamine hydrochloride and sodium acetate to dry distillation, decomposing the hydrochloride of the new base with concentrated potassium hydroxide and crystallizing.

It forms small, colorless, very hygroscopic needles, melting at 105° to 106° C. (221° to 222.8° F.). It is very soluble in water and in alcohol forming alkaline solutions; it is also soluble in chloroform, but insoluble in ether. It forms a very soluble salt with uric acid.

It should form a clear and colorless solution and give the usual alkaloidal reactions.

Being a strong base it is incompatible with acids and with the salts of many metals and of the alkaloids, which it decomposes.

Actions and Uses.—Lysidin is said to be a diuretic and is recommended as a uric acid solvent on the theory that, because it forms a very soluble salt with uric acid, it will facilitate the elimination of that substance. It is claimed that it is superior to piperazine.

It is recommended in gout, lithiasis and the various forms of the so-called uric acid diathesis.

Manufactured by Farbwerke, vorm. Meister Lucius & Bruening, Hoechst a. M. (Victor Koechl & Co., New York).

MERCUROL.

MERCURY NUCLEINATE.

Mercurol is an organic compound of mercury with nucleinic acid from yeast, containing 10 per cent. of metallic mercury.

It is prepared by adding a solution of mercuric chloride to an alkaline solution of nuclein, containing an excess of alkali, precipitating the resulting nucleinate of mercury by the addition of alcohol and a concentrated solution of a neutral salt (sodium chloride), separating the precipitate, washing and drying it.

It is a brownish-white powder, soluble in water, especially in warm water, insoluble in alcohol. Its watery solution has a distinct metallic taste, a weak alkaline reaction, and is not precipitated by alkalies, nor by albuminous liquids.

The mercury in this preparation resists the action of hydrogen sulphide to a marked degree

Actions and Uses.—Mercurol does not coagulate albumin; it has marked bactericidal power and possesses the pharmacologic action of soluble mercury compounds.

It is recommended as a local antiseptic application and as an antisyphilitic remedy.

Dosage.—0.03 to 0.12 Gm. (½ to 2 grains).

Manufactured by Parke, Davis & Co., Detroit, Mich. U. S. patent No. 637,355.

MESOTAN.

ERICIN.

Mesotan, $C_6H_4.OH.COO(CH_2.O.CH_3) = C_9H_{10}O_4$, is the methyl-oxymethyl ester of salicylic acid, analogous to wintergreen oil.

It is prepared by the action of chlormethyl ether on salicylates thus: $C_6H_4.OH.COONa + CH_2Cl.O.CH_3 = NaCl + C_6H_4.OH.COO(CH_2.O.CH_3)$.

It is a clear, yellowish, faintly aromatic, oily fluid, sp. gr. 1.2 at 15° C. (60° F.) and boiling at about 162° C. (323.6° F.). It is difficultly soluble in water, but readily soluble in the usual organic solvents and miscible with oils in all proportions. Above 100° C. (212° F.) it is decomposed yielding salicylic acid, formaldehyde and methyl alcohol and it is likewise decomposed to a certain extent by moisture in the air.

Its watery solution gives a violet color with ferric chloride and after heating or exposure to moisture it responds to the usual tests for formaldehyde. Concentrated sulphuric acid colors it red.

It should be kept in a cool place and preserved dry in well-stoppered bottles.

Actions and Uses.—The action of mesotan is similar to that of oil of wintergreen, but it is more irritating to the skin.

Dosage.—Being quite irritating when applied pure to the sensitive skin, it is employed diluted with an equal volume of olive oil, and without friction. Simple application to the affected part, which need not be covered, or, if so, only slightly, suffices to give prompt relief.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Continental Color & Chemical Co., New York). U. S. patent No. 706,018.

METHAFORM.

A name applied to chlorbutanol (which see).

Manufactured by F. Stearns & Co., Detroit, Mich. U. S. trademark.

MIGRAININ.

A mixture of antipyrine 85 parts, caffeine 9 parts and citric 6 parts.

It is a white powder soluble in 2 parts of water.

It is incompatible with acids, alkalies and metallic salts.

Actions and Uses.—It is antipyretic and analgesic, combining the actions of its components.

Dosage.—0.4 to 1 Gm. (6 to 15 grains) in powder, cachets or tablets, the dose being repeated once or twice during the day.

Manufactured by Farbwerke, vorm. Meister Lucius & Bruening, Hoechst a. M. (Victor Koechl & Co., New York). German patent No. 26,429.

NEUROCAINE.

BILLETS OF COCAINE. SCHIEFFELIN.

Each billet contains cocaine hydrochloride 0.05 Gm. (1/12 grain), without excipient. The billets are ⅛ inch long, 1/20 inch in diameter and very soluble.

Neurocaine is used for pressure anesthesia or as a local anesthetic in dental practice.

Prepared by Schieffelin & Co., New York. U. S. trademark, No. 43,837.

NEURONIDIA.

Elixir Diethylmalonylurea, Schieffelin.

An elixir said to contain in each 8 Cc. (2 fluidrams) 0.26 Gm. (4 grains) of veronal (diethylmalonylurea in a menstruum containing 35 per cent. of alcohol, with aromatics.

Dosage.—(8 to 16 Cc.) (2 to 4 fluidrams).

Prepared by Schieffelin & Co., New York. U. S. trademark No. 44,141.

NUTROSE.

CASEIN-SODIUM. SODIUM CASEINATE.

Nutrose is a sodium salt of milk casein, containing 65 per cent. of proteids.

It is prepared by dissolving moist casein, freshly precipitated from skimmed milk and washed with water, in solution of sodium hydroxide, evaporating the solution to dryness *in vacuo*, powdering the residue, washing it successively with alcohol and ether, and drying.

It is a coarse, white, odorless and tasteless powder, forming a turbid, adhesive solution with water, having an alkaline reaction toward litmus, but being acid toward phenolphthalein.

Incinerated on platinum foil, it evolves vapors similar in odor to burning horn and leaves at least 3 per cent. of a white, nonvolatile residue, which has an alkaline reaction and colors the Bunsen flame yellow. Casein can be detected by the biuret reaction.

It is incompatible with acids.

Actions and Uses.—Nutrose is recommended as a nonirritant nutrient in wasting diseases, such as the cachexias in carcinoma, anemia, diabetes, etc., and in acute and chronic febrile ailments, such as pneumonia, typhoid fever and tuberculosis.

Manufactured by Farbwerke, vorm. Meister, Lucius & Bruening, Hoechst a. M. (Victor Koechl & Co., New York). German patent No. 85,057.

(To be continued.)

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

103 DEARBORN AVENUE . . . . CHICAGO, ILL.

Cable Address . . . "Medic, Chicago"

Subscription price.....Five dollars per annum in advance

[*For other information see second page following reading matter.*]

SATURDAY, NOVEMBER 3, 1906.

THERAPEUTIC INOCULATION OF BACTERIAL VACCINES.

The third course of lectures on the Herter foundation at the Johns Hopkins Medical School, given by Sir Almroth E. Wright, has evoked unusual interest among those who heard the lectures. The subject of the lectures was "The Therapeutic Inoculation of Bacterial Vaccines and Its Application in Connection with Bacterial Disease." The lectures were profusely illustrated with charts and diagrams, but were delivered without notes.

Dr. Wright's visit to this country was a notable event. As he lectured not only in Baltimore, but also in Toronto, Washington, Boston, New York and Philadelphia, many of the profession fortunately heard him expound with great simplicity, vigor and clearness the results of his remarkable studies of immunity and their practical application.

It is less than four years since the phenomena of opsonic immunity were first clearly revealed by the work of Wright and his assistants, but it is already apparent that the new fields thus opened to investigation are of the highest scientific and practical importance,[1] and it is incumbent on the physician and surgeon to acquaint himself with the principles and methods of the new treatment by bacterial vaccines, although the application of the treatment should be entrusted only to those especially trained as immunisators.

It is possible here to indicate only briefly the general scope of the lectures delivered in Baltimore and to touch on a few special points. In the first lecture Dr. Wright subjected to a rapid critical review various existing methods of treating bacterial infections, as the expectant treatment, the use of antiseptics, the attempt to extirpate infected foci, efforts to increase the supply of lymph to areas of infection, antitoxic and antibacterial sera, etc., and he then considered the protective substances in the blood, dwelling mainly on those called "opsonins" which, by combining with bacteria, make them an easy prey to leucocytes. Skepticism was expressed concerning the therapeutic value of antibacterial, as distinguished from antitoxic sera, such benefit as the former may occasionally exhibit being attributed to their action as vaccines through the undesigned and uncontrollable presence of bacterial poisons, as is illustrated by Chantemesse's antityphoid serum.[2]

It was pointed out that the therapeutic efficacy of measures to increase the flow of lymph to infected areas, as by fomentations, the Finsen light treatment, Bier's hyperemia, etc., depends largely on the opsonic content of the blood, which varies much in different cases, which can be accurately measured, and which, in suitable cases, may be increased by bacterial vaccination.

In the first and second lectures Dr. Wright discussed such topics as the negative and the positive phases of immunity supervening on the inoculation of bacterial vaccines, the conditions under which pathogenic bacteria multiply in the infected organism, the activities and the inactivities of the machinery of immunization in different classes of bacterial infection, discriminating on this basis the strictly localized and the systemic infections, the methods of bacterial inoculation and the principles which should determine the administration of a vaccine and the propriety of intervention in aid of Nature's method of cure. An imposing body of verifiable facts, illustrated by curves plotted from actual cases, was presented which made it clear that the quantitative determination of the protective substances, particularly the opsonins, of the blood and of infected areas in the course of infectious diseases affords information of the greatest value for diagnosis, prognosis and treatment. Especially instructive were opsonic curves illustrating negative and positive phases resulting from autoinoculation in tuberculosis and other infections in consequence of physical and mental exertion, massage, surgical operation, menstruation and other circumstances, the relationship of such phases to the constitutional symptoms, and the diagnostic and therapeutic inferences to be drawn from these events.

In the third lecture were presented the results which have been achieved in the treatment of bacterial diseases by means of bacterial vaccines, and in general the field of application of this therapeutic procedure. The most numerous and the best curative results are obtained in localized chronic infections, such as many staphylococcus infections (furunculosis, sycosis, acne) and certains forms of tuberculosis, also in certain localized infections with the pneumococcus, the gonococcus, the streptococcus, the colon bacillus and other bacteria. Even in certain systemic infections where the machinery of immunization makes default, there is opportunity to intervene successfully by subcutaneous injection of bacterial vaccines, as was exemplified strikingly by a case of infectious endocarditis and several cases of Malta fever.

Of fascinating interest was the fourth lecture devoted to a full demonstration of the technical procedures which have been developed with such wonderful ingenu-

1. The admirable Middleton-Goldsmith lecture on "Phagocytosis and Opsonins" by Professor Hektoen, one of the leading and most productive workers in this field, gives an excellent summary of existing knowledge, with the addition of new facts relating to this subject. THE JOURNAL A. M. A., May 12, 1906.

2. A. E. Wright: The foundations of Serum Therapy, Clinical Journal, May 12, 1906.

ity by Dr. Wright for the estimation of phagocytosis, opsonins and other antibodies and for the preparation of bacterial vaccines. To those desiring to acquire the technic great assistance was afforded by the daily laboratory demonstrations by Dr. G. W. Ross, a co-worker who accompanied Dr. Wright. A fifth lecture full of practical interest was on studies of coagulation of the blood and their application.

Although a vast amount of work remains to be done before we can grasp its full import, it is already apparent that the message which Dr. Wright brings to the medical profession is comparable in its practical importance to that of Pasteur, of Koch, and of Behring. The lectures will surely stimulate laboratory work in this country in the field which he has opened. For those thoroughly trained in the new methods there is a career of great service to physicians and surgeons, and it is most desirable that our larger hospitals should make provision for such experts in immunization.

THE NATIONAL CONTROL OF LEPROSY.

Reference was made a few weeks ago[1] to the care and ultimate disposition of foreign-born lepers. The suggestion was then made that the Federal Government should make some additional provision for their deportation. The unfortunate circumstances surrounding the death of the Syrian leper at Pickens, West Virginia, and the dilemma in which he and the authorities of two states had been placed prior to his death, again recalls the great need of adequate means of dealing with the disease in this country.

The question is also of moment because more than one-half of the lepers in the United States are native born. According to the report[2] of the Commission authorized by Congress in 1899 to investigate the origin and prevalence of the disease in the United States, there were 278 cases residing in the various states in 1902, the time of this report, and, of this number, 145 were native born. Of the total number reported, only 72 were isolated at that time, being cared for in local institutions or isolated in their own homes under great disadvantages. There was at that time only one state institution for the exclusive care of lepers. Since then a colony has been established at Penikese Island, Massachusetts, where five lepers are segregated at great expense to the state.

The problem is already of interest to 21 states of the Union, and, in view of the rapid growth of our heterogeneous population, the other states may be confronted with it at any time. There can be no doubt that leprosy is a communicable disease, although slow in manifesting itself in the individual. Facts also seem to show that in countries where the disease is neglected it has a tendency to increase, while the opposite is the case where measures of prevention are practiced, as in Norway. An increase has been observed in certain South American and other countries—to such an extent in the Argentine Republic that the president of that republic recently convoked a conference to study the development of leprosy and to adopt measures to combat it.

The prevention of leprosy should also receive the serious consideration of our national government, the preservation of the public health and the dictates of humanity and science demanding the national care and control of the leprous under ideal hygienic surroundings. The necessity for immediate action is apparent to health authorities throughout the country, the Conference of State and Territorial Health Officers with the Public Health and Marine-Hospital Service having presented resolutions to that effect.[3] A bill for the segregation of lepers was also introduced in the Fifty-eighth Congress. It was passed by the Senate and favorably reported by the house committee on interstate and foreign commerce, but on the last day of the session, though brought up, it failed, through some misapprehension, to pass the House. The government has already made provision for a thorough investigation of the disease, Congress having provided for the establishment of a leprosy investigation station within the leper colony on the Island of Molokai. While an investigation of this character presents problems of unusual difficulty, yet it may be hoped that definite knowledge will in time be gained regarding the method of transmission, and it may be confidently predicted that an improved method of treatment will eventually be evolved. Meanwhile, it is urged that lepers in the United States be placed under national supervision and that a national home be established for their care. Such action would insure the speedy return of many of the alien cases to their native land, as they would be discovered in time to come within the provisions of the immigration law.

Under the present system of care, involving isolation of small groups or single cases, the expense is out of all proportion to the care of other indigents of the state. The opportunity for systematic study of the various types of the disease is lost, and the lack of facilities and the utter loneliness of the patients cared for in isolated prison-like leprosaria, defeats the end for which segregation is practiced.

A national leper home, located in a salubrious climate and provided with adequate facilities, would obviate these difficulties. Experience in the past has taught that such an institution would in no way be a menace to the health of the community, no case having been contracted by an attendant of the Louisiana leper colony nor by any inhabitant of the neighborhood during the past ten years. Life in such an institution, in addition to decreasing the danger of spread, would

1. Jour. A. M. A., Aug. 11, 1906.
2. Senate Document No. 269.
3. Transactions of the Third Annual Conference of State and Territorial Health Officers.

offer a larger field for study, and by providing sources of occupation and amusement would in a great measure relieve the absolute hopelessness of this otherwise hopeless class.

CAISSON DISEASE AND MEDICAL CERTIFICATES.

The series of tunnel operations that are now being carried on in the neighborhood of New York City have furnished abundant opportunities for the study of that curious affection of the nervous system called by the workmen the "bends," but known in medicine as caisson disease, and which we recently discussed from another viewpoint.[1] In addition to the necessity of gradual decompression, emphasized in our previous article, experience shows that a certain number of persons seem to have an idiosyncrasy for the disease and suffer from it under circumstances in which others have worked for long periods without any serious effects or even any signs of the pathologic conditions that prove so injurious and even fatal to their fellow-workmen.

The underlying lesions of the disease consist of small lacerated areas in the central nervous system consequent on the expansion of gas at certain points. Owing to the high pressure at which air is inspired, it exists within the body in a considerable degree of compression. If this be suddenly relieved, as happens when a workman —without the precautions of the interlocking system— passes from the caisson to the outer air, then minute ruptures of the tissues of the central nervous system take place and small hemorrhages ensue, because the free air present is usually contained within small blood vessels, and if these lesions occur at important points lasting injury or death is the result. In order to avoid such unfortunate consequences, strict medical examinations of the men to be employed have been required and a medical certificate demanded before the workmen are allowed to enter the caissons. As the result of careful investigation in certain recent cases, it would seem that some workmen have succeeded in evading these regulations, though at awful cost to themselves. Some of the strong, healthy men have been selling their medical certificates to other less robust individuals who either had actually been refused employment on the work or felt sure that they would be, and the consequences have been, as might be expected, very serious for the substitutes.

The whole affair has furnished a striking reminder of the fact that medical certificates generally will probably have to be accompanied by photographs, as they are required to be by law in certain of the European countries, if they are to be of any value. If workmen will risk their lives in order to secure work in so dangerous a trade, in spite of the precautions that are taken to save those who are almost sure to succumb, it can be readily understood that medical certificates will be passed on much more freely when issued under other circumstances. We are coming to a point where medical certificates are to be required of workmen much more frequently, both for their own protection and that of others entrusted to their care, than has been the case in the past. Proper regulations, therefore, will have to be maintained to guard against this abuse of certificates or they may become the source of more harm than good.

1 THE JOURNAL A. M. A., Sept. 1, 1906.

THE REQUIREMENTS FOR THE PRACTICE OF SURGERY IN HOSPITALS.

In his presidential address before the Colorado State Medical Society,[1] Dr. H. G. Wetherell discusses the so-called open hospital and certain abuses connected therewith. He points out that "throughout the west the hospitals are open to all reputable practitioners of medicine, and any of them may send a patient to a hospital and undertake any surgical operation he chooses, regardless of his lack of skill or experience in performing such operation." That the privilege of the open hospital is subjected to great abuse and that surgery is practiced both in and out of hospitals by incompetent and inexperienced men are, of course, matters of common knowledge among physicians. Dr. Wetherell's frank discussion of the situation is additional evidence of the existence of a feeling that the time has come when steps must be taken toward regulation and reform.

In view of the fact that under our present conditions any licensed physician may practice surgery if he so chooses, no matter whether or not he is in possession of the necessary training and ability, the question as to who is to be allowed to operate in a hospital must be decided by the hospital itself. Of course, the practice in some places, now long continued, of unrestricted hospital privileges can not be abolished or reformed at once. The reform must be brought about gradually, and Dr. Wetherell suggests that the hospitals in a city might unite in referring questions of this kind to a general board of hospital councilors for discussion, advice and even final action. Such boards might result in much good if placed on a firm basis. We can see, for instance, that a careful statistical study on a uniform basis of the surgical operations and their results in the various hospitals in a city would afford much valuable information as to what steps ought to be taken in order to secure the best results. Publicity would be a powerful factor in directing the attention of those most interested to the need for stricter regulation of surgery in the open hospitals.

As pointed out by Wetherell, we have in Maurice H. Richardson's address at the Portland session of the American Medical Association an excellent discussion of the great question as to who should practice surgery.[2] This address should be studied by all who desire to

1. Colorado Medicine, October, 1906; abstract in THE JOURNAL, October 27, p. 1403.
2. THE JOURNAL A. M. A., Oct. 7, 1905.

learn the requirements necessary for a reasonably successful surgical practice as conceived by those best fitted to know. We hope that the important practical problems discussed by Richardson and by Wetherell may continue to receive increasing thought and consideration, so that before long more definite and exacting requirements for entrance on surgical practice may become established than is the case now. In this phase of the evolution of American surgery our hospitals play a rôle of great responsibility which our hospital authorities must be brought to realize more keenly than is now the case in many parts of the country.

X-RAY DANGERS.

Up to the present time the dangers of the *x*-ray have been largely believed to be confined to the accidental burns, at least in the ordinary therapeutic use of the agent. Of course, with long-continued and frequent exposures more serious results are admitted as possible, as in the well-known cases of certain operators and experimenters, such as those of Edison's assistant and the English expert, noticed in our London correspondence this week.[1] Dr. Edsall's paper, in the present issue of THE JOURNAL,[2] however, points out some perils that, even in the ordinary brief exposures, had not been generally anticipated. It may be that among the almost innumerable cases thus treated up to the present time there have been some serious accidents that should have been, but were not, credited to the ray, and Dr. Edsall's observations would certainly indicate such a possibility. Indeed, he gives testimony as to their actual occurrence. His experimental results, moreover, show a far more serious constitutional effect of this agent than had been generally suspected. It may be that we have sometimes been playing with fire in the use of this agent and have unconsciously caused pathologic conflagrations, so to speak. It is highly probable that in the vast majority of cases no harm can result, but the parallel with anesthetics is an apt one and seems to fit the case thoroughly. The recent death of a Pennsylvania capitalist while undergoing an application of the *x*-ray, whatever may have been the actual cause of death, is at least suggestive of caution in its use. There is also to be considered the question of the effect of the *x*-ray on the reproductive organs in causing sterility, as well as the possibility of psychic effect in some nervous cases, which may be even dangerous in rare instances. The beneficial effect of the ray in certain diseases is unquestionable and their value for surgical diagnosis is even better established. There is a great deal yet to be learned, however, as regards both its physiologic and its pathologic effects.

THE DEAD LINE IN SPORTS.

Certain periodicals and magazines in Great Britain and in this country have been discussing the "dead line" in sports, i. e., the age limit beyond which certain sports must not be indulged in or serious consequences may result. It has been claimed, for instance, that football should not be played after 30 because of the danger of injury to the gradually hardening tissues of the adult after full growth has once been reached. The age limit for cricket in England and for baseball in this country was set down as 40, though it is confessed that some men can indulge in these sports with impunity after this age. It seems impossible, however, to determine any absolute limitation for individuals in this matter since all depends on the condition of heart and arteries, as well as the facility with which the necessary movements are accomplished. It is well-known, for instance, that England's greatest living cricket player continued to indulge in the game until after sixty, without either injuring himself or losing any of his skill. Not a few of our baseball players in this country have been fifty years of age before they gave it up, and yet maintained their reputations for skilful playing until the end of their baseball career. The "dead line" in sports, however, is an individual proposition, and does not depend on set rules or supposed age limitation. Provided the indulgence in sport is kept up more or less continuously, a man's own feelings in the matter are likely to provide better data as to when such exertion must be given up than any hard and fast rules. On the other hand, there is distinct danger for a man who has been a good player at a particular sport in his younger years if he should attempt to indulge in it after a long interval during which he has given no time to it. This is where the most serious danger lies. Such a man knows nothing of his limitations, and in attempting to accomplish as much as when he was younger, very easily overdoes the exertion that his present condition of lungs and heart and arteries will permit. Instead of discouraging indulgence in out-door sports after middle life by the setting of artificial limitations, we should rather encourage them, and especially emphasize the advisability of maintaining unimpaired to a rational degree the capacity for exercise acquired by the individual as a young man.

CHINA AND THE OPIUM TRAFFIC.

Hard on the condemnation of the opium traffic by the British parliament, noted in THE JOURNAL, Aug. 22, 1906, comes the announcement that the Chinese government has issued an edict making provisions for the suppression of the use of opium in its dominions. In this it follows the example given by Japan, which, both in its own territory and in its outlying dependencies, has made the use of opium a matter of strict legal restriction for a long time past, and of Australia which has had a rigid law since the beginning of the present year. England will, therefore, be helped in the right way toward abolishing the opium business, so profitable in the Indian revenue, by the loss of its principal market—that is, if the Chinese government is honest and can enforce its laws. It has been hinted by correspondents in the public press that it only intends to establish a profitable monopoly for itself, but this, perhaps, may be doubted. The evil of opium using is probably greater in China than anywhere else in the world and it follows the Chinese wherever they go and contaminates other races. It is really a world question and one in which

1. See page 1498.
2. See page 1425.

every step of progress should be welcomed by every well wisher of humanity. Opium as a medicine is invaluable, but its non-medicinal use is a curse wherever it exists.

THE INDEX MEDICUS.

It is reported that the Carnegie Institution is considering the discontinuance of the *Index Medicus* on account of lack of financial support from the medical profession. It is to be regretted that such a reason exists; there should be sufficient support for the *Index*, now the price has been made moderate. The *Index Medicus* holds a place by itself among periodicals. It is the one accurate and complete bibliography of current medical literature, and its discontinuance would be a world-wide misfortune.

Medical News

ALABAMA.

College Opens.—The Birmingham Medical College opened for its thirteenth annual session, October 3, with addresses by the dean, Dr. Benjamin L. Wyman, Dr. E. D. School and Dr. E. P. Hogan, secretary of the college. The only faculty change noted is the appointment of Dr. E. P. Hogan, who succeeds Dr. John C. La Grande, deceased, as secretary of the faculty.

Personal.—Dr. Rhett Goode has been elected dean of the Medical College of Alabama, Mobile, vice the late Dr. George A. Ketchum.——Dr. Henry A. Moody and wife, Mobile, had a narrow escape from death in the recent storm and flood which devastated the Gulf Coast.——Dr. T. L. Colwell has been appointed physician at the furnaces of the Tennessee Coal, Iron and Railway Co., Bessemer, vice Dr. George A. Hogan.

ARKANSAS.

Diphtheria.—On account of an epidemic of diphtheria, the public school of Harrisburg has been ordered closed temporarily, and children have been forbidden to attend public gatherings.

Runyan Resigns Secretaryship.—At the meeting of the State Board of Medical Examiners, held October 9, the resignation of Dr. Joseph P. Runyan, secretary of the board, was received, and Dr. Fred T. Murphy, Brinkley, was elected in his stead. As a mark of the esteem in which he is held by the members of the board, Dr. Runyan was presented with a gold-headed cane, which was inscribed, "Arkansas State Board of Medical Examiners to Dr. J. P. Runyan, an Exemplary Secretary, 1906."

Medical Colleges Open.—The Medical Department of the University of Arkansas, Little Rock, opened for its regular term October 1. The opening address was made by Dr. Edwin Bentley, dean of the faculty.——The formal opening of the College of Physicians and Surgeons, Little Rock, and the Little Rock Sanitarium was held October 1, and the college opened for its regular work October 3. The opening addresses were made on that day by Dr. William C. Dunaway and Dr. Joseph P. Runyan, dean of the faculty, presided.

CALIFORNIA.

Hospital Burns.—The Military Hospital at the Presidio of Monterey, a large two-story frame building, was totally destroyed by fire October 13. Although the building was full of patients, some of whom were critically ill, all were removed in safety. The loss will probably amount to $50,000.

Faculty Changes.—At the annual meeting of the faculty of the University of Southern California, College of Medicine, Los Angeles, the resignations of the dean, Dr. Walter Lindley, and of the secretary, Dr. William D. Babcock, were received and accepted. The vacancies were filled by the election of Dr. William D. Babcock as dean, and Dr. George H. Cress as secretary. The resignation of Dr. Lindley was due to the pressure of other duties, and a vote of thanks was tendered him for his efficient services during his term of office.

Personal.—Dr. Jonas J. Moyer has been elected health officer of Mayfield.——Dr. Herbert F. True, Los Angeles, has returned after a year abroad.——Dr. Edwin Bunnell, San Francisco, was recently operated on for appendicitis at the Scobie Sanatorium.——Dr. Henry E. Sanderson has been elected a member of the Stockton board of education.——Dr. Charles G. Stivers, Los Angeles, has gone to the Atlantic seaboard.——Dr. and Mrs. William E. Hopkins, San Francisco, left for Europe, October 15.——Dr. Joseph A. Champion, Colton, who suffered severe injuries in a bicycle accident recently, is now convalescent.——Dr. and Mrs. Emmet Rixford, San Francisco, are taking a trip to the Atlantic coast.

COLORADO.

Typhoid Fever.—At the meeting of the Denver County Medical Society, October 2, the general opinion prevailed that the alarming number of typhoid-fever cases in the city was directly due to contaminated water, and that unless some effective work is done by the city health department and the water supply companies before next summer, a still greater number of cases may be expected.——It is reported that Leadville is on the verge of an epidemic of typhoid fever.

The Colorado Medical Legislative League.—The physicians of Colorado have an organization for political purposes with the above name. The league is non-partisan, and has considerable influence which is used openly but effectively when necessary. A circular has just been sent to the physicians of the state which reads as follows:

Dear Doctor:—While it would be folly for the medical profession to enter partisan politics as an organization, our sense of professional duty to the public obligates us to support candidates, irrespective of party affiliation, who favor the protection of the public health through the enactment of wholesome medical legislation.

The political influence of the doctor has been overlooked by the managers of partisan politics, but there is now a general awakening to our power as a political factor at the polls.

Our support, and the election, of men of different party affiliations, who favor enlightened legislation on the subject of public health, will present to them the most potent of object lessons.

We should strongly support those candidates who will labor for such legislation.

We enclose a list of candidates who have, in the past, demonstrated that they are worthy of our support. We urge on you the necessity of exerting your strongest efforts actively in their behalf.

Do not be satisfied merely with casting your own vote; but in your daily rounds do active campaign work, and secure the support of as many voters as possible.

Every doctor should be able to secure at least a half-dozen votes in behalf of the candidates whom we find worthy of support. In this sort of work it is necessary to favor men, as such, irrespective of party affiliations.

The time for action is short. Your efforts should be quick and vigorous.

CONNECTICUT.

Infectious Diseases.—During September there were reported to the State Board of Health 14 cases of measles in seven towns; 49 cases of scarlet fever in 17 towns; one case of cerebrospinal fever; 173 cases of diphtheria in 29 towns; 23 cases of whooping cough in 12 towns; 201 cases of typhoid fever in 54 towns, and 23 cases of consumption in 10 towns.

Personal.—Dr. James M. Keniston has resigned as superintendent of the Hartford Hospital and has been appointed to a position on the staff of the Connecticut Hospital for the Insane, Middletown.——Dr. and Mrs. Frank H. Whittemore, New Haven, have returned from Scotland.——Dr. Steven J. Maher, New Haven, has returned from attendance at the International Convention on Tuberculosis, The Hague.——Dr. Timothy T. Cohane, New Haven, has returned from Germany.

GEORGIA.

Personal.—Dr. Marion A. Born, Lawrenceville, is reported to be seriously ill with septicemia, contracted during a surgical operation.——Dr. Hansell Crenshaw, Atlanta, suffered a concussion of the brain by being thrown from a street car in Atlanta, September 26.

Election of Officers.—The Fifth District Medical Society met in Atlanta, October 16, and after an address by Dr. Henry H. Martin, Savannah, president of the Medical Association of Georgia, the following officers were elected: Dr. John C. Olmsted, Atlanta, president; Dr. E. Bates Block, Atlanta, vice-president, and Dr. Elias W. Ragsdale, Covington, secretary.

College Opens.—The seventy-fifth annual session of the Medical Department of the University of Georgia, Augusta, opened October 2. Dr. William R. Houston was appointed lecturer on diseases of the nervous system and Eugene L. Johnson lecturer on medical jurisprudence. The opening address was delivered by Dr. Joseph E. Allen on "The Twentieth Century Doctor in the Making," in which he divided the making of the

doctor into three periods: First, that of primray education; second, that spent in medical college, and third, that devoted to active practice.

ILLINOIS.

Typhoid Fever.—Typhoid fever is reported to the State Board of Health to be prevalent in 34 localities in the state in a more or less epidemic form.

District Society Meeting.—Dr. F. Whitfield Smith, Bloomington, councilor of the fifth district, has arranged for a meeting of the Tazewell County Medical Society for reorganization, at Pekin, November 8.

Commends Supervisors.—The Illinois State Board of Health has commended the action of the board of supervisors of Sangamon County in providing for the isolation of tuberculous patients in hospitals by the purchase of $200 worth of tents.

Military Tract Meeting.—The Military Tract Medical Association held its sixty-seventh annual session at Macomb, October 18. The following officers were elected: Dr. John P. Roark, Bushnell, president; Drs. Samuel Stremmell, Macomb, and Ernest E. Davis, Avon, vice-presidents, and Dr. Franklin E. Wallace, Monmouth, secretary and treasurer (re-elected).

Smallpox.—The smallpox situation at Wyoming is becoming serious. On October 25, 21 cases were reported to be present. ——Moline reports 3 cases of smallpox and the health commissioner has instructed the superintendent of schools to notify school children in the infected district that they must be vaccinated or remain away from school.——Smallpox is reported from Chillicothe.

State Charities Conference.—The eleventh annual session of the Illinois State Conference of Charities was held in Chicago, October 24, 25 and 26. The more important subjects discussed were the same as those at the Springfield meeting of the week before (see page 1384). The plan of converting all public asylums in the state into state institutions was approved by the speakers and by the conference. The establishment of a village for epileptics and a sanatorium for consumptives was also advocated. The conference authorized the appointment of five commissioners to act in conjunction with the State Board of Charities during the coming session of the legislature in procuring legislation favorable to the program outlined by the board.

Chicago.

Policeman Sells Rheumatism Cure.—B. H. Reed, a policeman, is said to have been fined $100 and costs, October 26, for practicing medicine without a license. The prosecution was instituted by the attorney for the State Board of Health, who claimed that Reed sold a medicine known as "Reed's Peerless Rheumatism Cure."

Deaths of the Week.—During the week ended October 27, 505 deaths were reported from all causes, 25 more than for the previous week and 35 more than for the corresponding week of 1905, equivalent to an annual death rate per 1,000 of 12.85. Pneumonia led the death causes with 69, followed by consumption and violence (including suicide), each with 49, and acute intestinal diseases with 43, heart diseases with 41, nephritis with 35, and cancer and nervous diseases with 24 each. Diphtheria caused 12 deaths and scarlet fever and typhoid fever each 8.

Pasteur Institute Report.—The Chicago Pasteur Institute announces a summary of the results of the preventive inoculation against hydrophobia attained since its inauguration in 1890. A total of 2,775 patients have received the anti-rabic treatment; of these, 2,474 were bitten by dogs, 100 by horses, 84 by cats, 29 by cows, 23 by skunks, 9 by calves, 9 by wolves, 5 by pigs, 4 by coyotes, 4 by mules, 2 by burros, and one each by a rat and a sheep. Hydrophobic human beings infected 31 patients. Of the patients, 1,406 had received severe and multiple bites on the hands and wrists, 584 on the leg and thigh, 388 on the face and head, 359 on the arms and 42 on the trunk. Only 7 deaths were reported, giving a mortality rate of 0.25 per cent. For reasons unknown seven individuals abandoned treatment, two of whom subsequently died from hydrophobia.

INDIANA.

Ground Broken for Hospital.—On October 15 Governor Hanley turned the first shovelful of earth in the excavation for the foundation of the new State Hospital for the Insane, Madison.

Physicians' Club Meets.—The Elwood Physicians' Club held its annual meeting October 9. The following officers were elected: President, Dr. Jabez H. Millikan; vice-president, Dr. Robert E. Marshall, and secretary-treasurer, Dr. Frank F. Mendenhall.

Burning Leaves a Cause of Illness.—The Indiana State Board of Health has decided that the smoke from burning leaves is a cause of eye and throat diseases among children, as well as a nuisance and an annoyance. The local health officers have been instructed to give notice to the people not to burn leaves.

Work in the Epileptic Village.—At the state epileptic village, Newcastle, two new buildings are being erected, the railroad has completed the siding to the site, and work has begun in earnest. The buildings under erection are to be used, one for the superintendent and the other for a dormitory to accommodate about 50 patients.

Physician Loses License.—The State Board of Medical Registration on October 12 revoked the license of George L. Dickerson, Terre Haute, convicted of having allowed Robert J. Dickerson, his brother, to use his diploma and certificate for practice in Logansport. Dr. Dickerson will, it is reported, appeal the case to the Superior Court of Vigo County.

Communicable Diseases.—Smallpox, diagnosed as "Cuban rash," has made its appearance in Richmond.——Diphtheria is said to be prevalent in Van Buren Township, Brown County, where 40 cases and 4 deaths have been reported.——The epidemic of diphtheria, which has been raging in Delaware County for three months, is reported to be abating.

Personal.—Dr. James M. Larimore, Greenfield, was assaulted in his office October 11, by Samuel Seward, who was angry because the physician had not responded to a call at his house.——Dr. Harvey Voyles, Bedford, fell from a ladder from the second story of his house, October 18, breaking both of his legs at the ankle.——Dr. F. Will Krueger has been appointed city physician of Richmond to succeed Dr. Allen L. Bramkamp. ——Dr. Joseph F. Gillespie has been appointed local surgeon of the Vandalia Railroad, at Greencastle, vice Dr. Ezra B. Evans, resigned.——Dr. Walter N. Fowler, Bluffton, who was a member of the Wellman polar expedition, arrived at his home from the Arctic regions, October 18.

KENTUCKY.

Must Report Tuberculosis.—The Board of Public Safety, Louisville, on October 18, issued an order requiring physicians of the city to report all cases of tuberculosis to the health office.

Correction in State Meeting Report.—In the report of the meeting of the Kentucky State Medical Association, page 1402, Dr. Arch Dixon is reported to have said: "An early resort to external urethrotomy will greatly *hasten* the number of cases, etc." He asks us to announce that this should read "will greatly *lessen*, etc."

Tuberculosis Hospital for Louisville.—By the will of the late Dr. John A. Ouchterlony, his estate, valued at $100,000, was devised to the Rev. Charles P. Raffo and two other residuary legatees that a tuberculosis hospital for Louisville might be founded. The will was contested, but has now been compromised, and the bequest thus made available for the original purpose.

Personal.—Dr. Mandeville Thum, Louisville, in reported to have been adjudged insane by the criminal court, October 15. ——Dr. Benjamin Letcher, Henderson, who was stricken with paralysis, October 15, is reported to be in a critical condition. ——Dr. Walter R. Francis, Bowling Green, was seriously bruised about the head and face in a runaway accident, October 11.

MARYLAND.

Baltimore.

Added to Medical Staff.—The following have been added to the staff of the Church Home and Infirmary: Drs. W. S. Thayer, Lewellys F. Barker, Julius Friedenwald, Josiah M. Slemons, Richard H. Follis and John Ruhräh. During the summer the hospital averaged 50 patients daily, and it was impossible to accommodate all applicants. Early next year an addition will be made to the building.

Personal.—During the absence of Dr. Henry Hurd in Europe Dr. Herbert Norton will fill his place as superintendent of the Johns Hopkins Hospital.——Dr. Howard A. Kelly has returned from his summer vacation in the Canadian woods and abroad. ——Dr. Hodge A. Newell has resigned from the house staff of the City Hospital to commence practice in Maplesville, N. C., his native town.——Dr. Edward Grempler has been elected president of the Southwest Baltimore Improvement Association.——Prof. D. M. R. Culbreth has resigned the chair of materia medica at the University of Maryland School of Medicine and Prof. J. E. Gichner will deliver the lectures on that branch.

NEBRASKA.

Fire in Medical School.—Fire broke out in the basement of Creighton Medical School, October 10, and for a time threatened the entire building, but by strenuous efforts the fire department managed to confine it to the basement and first floor. The damage is estimated at about $1,000, fully covered by insurance.

Diphtheria.—Diphtheria has broken out in the Walnut Hill district, Omaha, and the Health Commissioner has warned the citizens of that district regarding the disease. On October 20 the commissioner sent a circular to every physician in Omaha requesting coöperation with the health department in stamping out the disease.

Personal.—Dr. J. M. Alden has retired from the superintendency of the Norfolk Hospital for Insane, and Dr. George A. Young, Lincoln, has assumed charge of the institution.——Dr. Harrison A. Wigton, Omaha, has been appointed assistant superintendent of the Nebraska Hospital for the Insane, Lincoln, vice Dr. George A. Young.——Dr. Claude W. Mason, Omaha, has gone to Siam as a medical missionary, under the Presbyterian Board of Foreign Missions.

NEW YORK.

Wertheim in Buffalo.—Prof. Ernst Wertheim of Vienna spent October 7 and 8 in Buffalo, the guest of Drs Joseph P. F. Burke and Max Keiser.

Medical Library Association Election.—At the annual meeting of the Utica Medical Library Association, October, Dr. Frederick J. Douglas was elected president, Dr. Conway A. Frost, vice-president, Dr. Fred W. Smith, secretary, Dr. James E. Gage, treasurer, and Dr. Smith Baker, librarian.

Buffalo Deaths.—For the nine months ended September 30, 276 more deaths were reported in Buffalo than for the corresponding period of 1905. The increase in deaths is apparently due in a great measure to summer diseases, 301 more deaths having occurred in the summer months than in the corresponding months of 1905. There has been a slight falling off in the deaths from smallpox, scarlet fever and diphtheria, and a marked decrease in the deaths of children under 5 years of age.

Personal.—Dr. Roswell Park, Buffalo, has been elected a member of the Association of French Surgeons. He is said to be the fourth surgeon in the United States to become a member of this society.——Dr. A. Wilson Dods, Fredonia, and Dr. C. H. Richards, Dunkirk, sailed October 7 for Europe.——Dr. Cornelius W. De Baun, Fonda, was thrown from his carriage in a runaway accident, October 1, and sustained a compound fracture of the right leg above the ankle.——Dr. William M. Gibson has been elected president, Dr. Earl D. Fuller, vice-president, and Dr. Andreid Sloan, secretary-treasurer of the Medical Society of the Staff of St. Luke's Hospital, Utica.——Dr. Theodore I. Townsend, for several years assistant physician at the Utica State Hospital, has resigned to accept a position as first assistant of the Dannemora State Hospital.——Dr. Leonard Saxer, Syracuse, has been appointed a member of the Board of Managers of the St. Lawrence State Hospital, Ogdensburg, to fill an unexpired term.——Dr. Charles C. Duryee has been elected president, Dr. Edward J. Wiencke, vice-president, and Dr. Walter W. Goddard, secretary of the medical staff of the Ellis Hospital, Schenectady.

New York City.

The Harvey Society Lecture.—The second lecture in the Harvey Society course will be delivered at the New York Academy of Medicine, Saturday evening, November 3, at 8:30, by Prof. C. A. Herter, on "The Common Bacterial Infections of the Digestive Tract and the Intoxications Arising from Them."

Library Presented.—The library of the late Dr. Willard Parker, containing 4,000 volumes, was formally presented to the Medical Society of the County of Kings, October 16. The presentation was made by Dr. Willard Parker, his son, who will be made an honorary member of the association.

The Bulkley Lectures.—Dr. L. Duncan Bulkley will give his eighth annual series of clinical lectures on diseases of the skin in the out-patient hall of the New York Skin and Cancer Hospital on Second Avenue and Nineteenth Street, on Wednesday afternoons at 4:15, beginning November 7. The course will be free to the medical profession.

Friction at Bellevue.—A full meeting of the board of trustees of Bellevue and the Allied Hospitals was held October 25, when the difficulties were discussed that have arisen between the superintendent, Dr. Armstrong, and the members of the staff, who allege that the reform measures introduced by Dr. Armstrong are in some instances too severe.

New Home for Hospital.—Invitations are out for the formal opening of the new building of the Manhattan Eye, Ear and Throat Hospital, October 30. The new building is seven stories in height and will have 141 beds. On the fourth floor are 27 private rooms, where surgeons may treat their own patients. At the old hospital 30,000 new patients were treated during the past year, and 120,000 visits of patients were registered.

Contagious Diseases.—There were reported to the sanitary bureau for the week ended October 20, 359 cases of tuberculosis, with 174 deaths; 194 cases of diphtheria, with 22 deaths; 121 cases of typhoid fever, with 25 deaths; 89 cases of scarlet fever, with 3 deaths; 61 cases of measles, with 4 deaths; 24 cases of whooping-cough, with 13 deaths; 11 cases of cerebrospinal meningitis, with 13 deaths; 20 cases of varicella, and 2 cases of smallpox—a total of 881 cases and 254 deaths.

Personal.—Dr. Timothy D. Lehane, coroner's physician, is suffering from septicemia, due to an autopsy wound.——Drs. Earl W. Phillips and Harry W. Satchwell, internes at Bellevue Hospital, are ill with typhoid fever.——Dr. James E. Kelly, who was severely scalded on his yacht several weeks ago, has been removed to his summer home at Bayville, L. I.——Dr. William S. Bainbridge was chosen honorary secretary of the First International Conference on Cancer, held in Heidelberg last month.——Dr. F. G. Emerson, Brooklyn, has returned from Europe.

Hospital News.—The Margaret J. Plant pavilion for private patients, connected with St. Luke's Hospital, was opened to receive patients October 18. The building, which has been completed at a cost of about $500,000, is eight stories in height, nearly a block in extent and contains private rooms for 65 patients.——Stock aggregating $90,000 is to be issued for hospital purposes by the Board of Estimate. Of this the new Fordham Hospital will receive $40,000 for furnishings, the Gouverneur Hospital, $20,000 for a new wing, and the new Harlem Hospital, $30,000.——Dr. George H. F. Schrader has proposed to give an addition to the Cancer Hospital at Hawthorne, known as Rosary Hill Home. The building is intended to be an entertainment hall for the patients and visitors.

NORTH CAROLINA.

Diphtheria Decreases.—The city health officer of Kinston reports that the diphtheria situation is very much improved and hopes very shortly to be able to release all patients at present under quarantine.

Personal.—Dr. William C. Mebane, Mount Airy, is recovering from an attack of typhoid fever.——Dr. P. L. Murphy, superintendent of the State Hospital at Morganton, underwent operation at the Second Protestant Infirmary, Baltimore, October 18.

Annex to State Hospital.—The new annex to the North Carolina State Hospital for the Insane, Raleigh, will soon be ready for occupancy. The building will have accommodations for 102 additional patients and will in a measure relieve the overcrowding of the institution, but it will be impossible to provide for several hundred outside the institution until after the meeting of the legislature in January next, when it is hoped that provision for additional buildings will be made.

OKLAHOMA.

Insane Asylum Report.—The quarterly report of the Oklahoma State Insane Asylum, Norman, made October 2, shows that there were 523 patients in the asylum. During the three months just past 68 patients were received, 30 discharged and 24 paroled.

Would Prohibit Sale of Cocain and Morphin.—A bill will be asked to be enacted by the first state legislature prohibiting the sale of cocain and morphin without a physician's prescription. The bill is modeled on the statutes now in force in Missouri and Illinois.

Hospital Items.—It has been suggested that Oklahoma City make an arrangement with the management of St. Anthony's Hospital, whereby the facilities of that institution may be at the service of the city when required.——Dr. W. A. Fullington has been chosen president of the staff of Bethany Hospital, Oklahoma City; Dr. Claudius B. Bradford, secretary, and Drs. John A. Reck and Alexander B. Baird, members of the executive committee.——The Methodist Episcopal Church of Oklahoma and Indian Territory is about to take charge of Guthrie Hospital.——Drs. W. M. Turner, James L. Lewis and David A. Myers are erecting a modern hospital at Lawton to cost $8,000.

OREGON.

Infectious Diseases.—An epidemic of typhoid fever is said to be raging in the southern part of Wasco County.——Diphtheria has appeared among the school children of Portsmouth, where four cases are reported.

Must Report Tuberculosis.—At a meeting of the Portland board of health, October 1, a resolution was adopted to make it compulsory on all physicians to make a report of patients afflicted with tuberculosis, in accordance with the requirements of the city ordinances.

Eastern Oregon Physicians Meet.—The Eastern Oregon District Medical Society met in Pendleton, September 26, and elected the following officers: President, Dr. Jacob Prinzing, Ontario; vice-presidents, Drs. J. A. Geisendorffer, The Dalles, and A. E. King, Antelope; secretary-treasurer, Dr. Clark E. Saunders, Union; Dr. Grant W. Gregg, Wallowa, member of the board of censors; Drs. Charles J. Smith, Pendleton, and John A. Reuter, The Dalles, delegates to the state society, and Drs. Lazier, Weston, and Charles W. Thomas, Milton, alternates. The next session will be held at Radium Springs, Baker County.

PENNSYLVANIA.

Diphtheria.—Diphtheria is said to be specially prevalent in the Second ward of Allegheny, in which 9 cases have recently appeared, with 2 deaths. In other sections of the city 11 cases developed during the same period of time. On account of the number of cases the department of health has closed the Sherman school.

Hospital Items.—The annex to the Oil City Hospital, erected at a cost of $25,000, has been completed. The amount necessary for its erection was donated by an anonymous benefactor. ——A mass-meeting was held recently at Lansford to encourage the movement for the establishment of a hospital in Panther Creek Valley.——The Presbyterian Hospital in Allegheny will be partly under roof before cold weather sets in. The building will cost $250,000.

Alienists Meet.—The semi-annual meeting of the Association of Trustees and Physicians of State and Incorporated Hospitals for the Insane of Pennsylvania was held at the State Asylum, Philadelphia, and Thomas C. Zimmerman, trustee of The following officers were elected: Dr. Hugh B. Meredith, superintendent of the State Hospital for the Insane, Danville, president; Dr. Robert H. Chase, superintendent of Friends' Asylum, Philadelphia, and Thomas C. Zimmerman, trustee of the State Insane Asylum for the Chronic Insane, South Mountain, vice-presidents, and Dr. Morris S. Guth, superintendent of the State Hospital for the Insane, Warren, secretary. The next meeting will be held at the State Asylum for the Insane, Norristown.

Personal.—Dr. Samuel C. Seigle, Center Square, after practicing for 33 years, has retired.——Dr. Simon P. Earnest, Delmont, who underwent an operation for appendicitis several weeks ago, has recovered.——Dr. Andrew B. Gloninger, Lebanon, returned from Europe October 7.——Dr. J. Harvey Fronfield, Media, entertained the Delaware County Medical Society at the Rose Tree Inn, Chester, October 11.——Dr. William C. Meanor, Beaver, has been appointed oculist for the Pennsylvania Lines West.——Dr. and Mrs. William H. Taylor, Irwin, have returned from Europe.——Dr. Samuel M. Todd, Boyerton, who has been seriously ill, is reported to be convalescent. ——Dr. Thomas C. Stellwagen, Media, fractured his right forearm recently while on his power boat.——Dr. Frederick S. Kaufman, Lebanon, who has been seriously ill, is reported to be much improved.

Philadelphia.

Typhoid Cases.—During the week ended October 19, 93 new cases of typhoid fever were reported, an increase of 6 over the number reported for the previous week. Cases are reported from every ward in the city.

Course in Internal Medicine.—Drs. William E. Hughes and Robert N. Willson will conduct a series of postgraduate courses in internal medicine during the fall and winter in the wards of the Philadelphia Hospital. Each course will comprise six weeks of bedside teaching.

Personal.—Dr. William N. Angney, chief police surgeon, is reported to be critically ill with malignant disease of the stomach at the Pennsylvania Hospital.——Dr. S. Lewis Zeigler has been elected executive medical officer of the Wills Eye Hospital, and Dr. John H. Trinder, resident physician at Girard College.——Dr. David B. Birney was thrown from his carriage in collision with a trolley car, October 14, and badly bruised.

WISCONSIN.

Diphtheria Closes School.—The high school of Black River Falls was closed October 23 on account of diphtheria.

Wertheim in Milwaukee.—Dr. Ernst Wertheim, Vienna, has been the guest of Dr. Gustav A. Kletsch, Milwaukee.

College Opens.—The Wisconsin College of Physicians and Surgeons opened for its fourteenth annual session September 25. Dr. A. Hamilton Levings, president of the faculty, presided.

Should City Pay for Care of Consumptives?—The State Tuberculosis Commission has under consideration the advisability of commencing a friendly suit against the city of Milwaukee to determine whether or not that city can be compelled to segregate and care for its tuberculosis patients.

Illegal Practitioner Fined.—Robert E. Harter, claiming to be a "skin doctor," was arraigned in the district court of Milwaukee, October 8, charged with practicing medicine without a license, and is reported to have been fined $20 and costs. The attorney for the State Medical Board prosecuted the case.

Smallpox.—Five cases of smallpox were discovered in Two Rivers, October 18.——The local health authorities of Manitowoc report the appearance of seven cases of smallpox in the northern section of Manitowoc County.——A case of smallpox has appeared in the Mendota State Hospital for the Insane.

Do Not Wish Names Mentioned.—At a meeting of the Calumet County Medical Society, held in Chilton, it was resolved that the society should request the editors of all local papers circulating in Calumet County to refrain from mentioning the names of physicians in attendance in cases of illness or accident, and that members of the society discontinue their cards of announcement in the public press.

Personal.—Dr. Mark A. Bailey, Fennimore, has been appointed a member of the State Board of Medical Examiners, to fill out the unexpired term of Dr. Frank P. Klahr, Horicon, resigned.——Dr. August Sauthoff, Madison, has been elected assistant physician to the State Hospital for the Insane, Mendota.——Dr. James S. O'Brien has been elected president, Dr. George D. Ladd, vice-president, and Dr. George W. Fox, secretary-treasurer of the St. Mary's Hospital Board, Milwaukee.

GENERAL.

Convention on Epilepsy.—The National Association for the Study of Epilepsy and the Care and Treatment of Epileptics will hold its annual meeting in New Haven, Conn., November 8, under the presidency of Dr. Max Mailhouse of New Haven.

New England Railway Surgeons to Meet.—The New York and New England Association of Railway Surgeons will hold its sixteenth annual meeting at the New York Academy of Medicine, November 14 and 15, under the presidency of Dr. Joseph P. Creveling, Auburn, N. Y. On Wednesday morning there will be a symposium on shock, including papers on "Shock from Anesthesia," "Shock from Traumatism," "Psychic Shock" and "Postoperative Shock." The secretary is Dr. George Chaffee, 338 Forty-seventh Street, Brooklyn.

Light on Tuberculosis Congresses.—We are requested by the National Association for the Study and Prevention of Tuberculosis to publish the following note: Notices have been sent to many physicians throughout the United States and are appearing in the medical and public press regarding an "American International Tuberculosis Congress," to be held in New York City, November 14 to 16 next, and an association known as "The American Anti-Tuberculosis League," which is to meet in Atlantic City next June at the time of the meeting of the American Medical Association. It should be stated that the gathering in New York next November and the one in Atlantic City next June have no connection whatever with the International Congress on Tuberculosis authorized at the last session in Paris in 1905, which will hold its next meeting in Washington in 1908 under the auspices of the National Association for the Study and Prevention of Tuberculosis.

Health of Colon.—According to Dr. Mohr, in *Public Health Reports*, the health conditions of Colon and vicinity show a decided improvement during the past three weeks. The number of cases of malarial fever presented for treatment is considerably less, and fewer cases of pneumonia are being found. This improvement may be attributed to the prevailing good weather and the fresh winds, which have had the effect of drying up pools and collections of water, thus notably diminishing the number of mosquitoes. The work of permanently improving Colon is being rapidly pushed forward. The principal streets are being paved with vitrified brick and others are being macadamized. Before the advent of the next rainy season

all the houses in Colon will be connected with the water and sewerage systems. The reclaiming of large tracts of ground by drainage on the island now permits of extensive building which will relieve the overcrowding of houses, a feature which has greatly retarded the sanitary work in Colon.

FOREIGN.

Osler Gives Harveian Oration.—The Harveian Oration before the Royal College of Physicians, London, was delivered by Dr. William Osler, Oct. 18, 1906, on "The Growth of Truth, as Illustrated in the Discovery of the Circulation of the Blood."

Prevalent Diseases in Japan.—Passed Assistant Surgeon Cumming reports a widespread epidemic of what appears to be cerebrospinal meningitis in Tokio, and that plague seems to be rather serious in Waykayama ken, a prefecture not far from Kobe.

Advertising Write-ups Presented as Papers at Society Meetings.—An editorial in the *Deutsche med. Wochschr.*, October 11, comments caustically on the lack of oversight of communications accepted by scientific congresses. The text on which the editorial is based is an article on "The Chemistry and Technology of Malt Coffee," read at the last Naturforscher Congress. A hectographed summary of the article has just been received by the editor, arriving in an envelope stamped "Stuttgart" and with the printed heading, "Seventy-eighth Congress of German Physicians and Naturalists," thus suggesting that it was an official communication from the congress. Accompanying the abstract was a hectographed letter from the author, privat-docent Junghahn, of the Charlottenburg College of Technology, commending the article to the good graces of the editor and expressing the hope that he would publish the abstract. The editor comments that this "scientific communication" is being utilized in a not very nice way for advertising purposes, and evidently with the concurrence of privat-docent Junghahn. He exclaims further: "How many really good communications in the section may have had their time unnecessarily shortened to make way for this Junghahn article! The officers of a congress have the power, and it is their duty to see that these conditions are improved."

LONDON LETTER.

(*From Our Regular Correspondent.*)

London, Oct. 6, 1906.

A Physician a Victim to the X-Rays.

One of the principal *x*-ray specialists in the country, Mr. Hall-Edwards of Birmingham, president of the British Electrotherapeutic Society, has fallen a victim to his work. He was always greatly interested in photography, for which he gained medals all over the world. When the *x*-rays were introduced he was one of the pioneer workers and devoted himself to their study with enthusiasm. He worked at them unconscious of peril and neglected his general practice as a physician until he became one of the foremost experts in the country. In 1900 he went out as a radiographer in the Boer War, and afterward published the result of his experience on the battlefield. On his return he began to feel the ill effects of his work. Warts appeared on his fingers. He has excruciating pain, as if a red-hot needle were run into the hand and up the arm. He still continues his work, but he uses gloves. In a letter to the *British Medical Journal* he asks for some suggestions as to treatment. Despite all methods of protection his hands are steadily growing worse. He has not experienced a moment's freedom from pain for more than two years, and at times the pain is so severe that he is rendered absolutely incapable of work, mental or otherwise. In cold weather he is unable to dress himself and the pain experienced can not be expressed in words. On the back of each hand are from 50 to 60 warts, many of them confluent. Drugs have so far failed to give him the slightest relief. Ointments he finds as a rule to be injurious. The warts are so sensitive and painful that it is impossible to remove them with sandpaper. He therefore uses a treble-strength lotion of lead and opium in the form of a poultice. This softens the warts so that they can be removed by scraping with a knife. For two or three days after this application the pain is increased, but the fingers are rendered more pliable and mobile. The increased pain experienced after this treatment is due to the fact that in removing the warts small sores are left. The excruciating ever-present pain appears to be due to permanent irritation of the cutaneous nerves which nothing relieves and which is intensified by holding the hands in a dependent position and by cold. The pain is of a neuralgic character and is intensified from time to time by sudden stabs and jumps of such severity as to make him cry out. He has so far received so little relief from any method of treatment that he has given up all hope. Specialists all over the world—in France, Germany and America—have given him advice without effect. One suggestion was to use a preparation of pitch, it being thought that the darkness induced would have a healing influence. Cocain painted on, however strong, gives no relief. He does not take morphin because he can not endure the smallest dose. Hard lumps may be removed with emery paper, but they recur and develop into ulcers which take years to heal. He attributes his condition to the absence of precautions to protect himself, and warns other workers to be more careful.

Correspondence

Insurance Examination Fees.

————, Oct. 10, 1906.

To the Editor:—One would infer from recent protests on the subject of fees for life-insurance examinations that the *casus belli* is of recent origin, and yet with a few notable exceptions the companies that now pay less than a minimum fee of $5 have had a graded fee bill for many years. The only companies which I now recall that have recently adopted a graded fee bill are the Equitable, Mutual Life, Home Life, Germania, Security Mutual and Phoenix Mutual.

In my opinion, a graded fee bill is wholly wrong, unequitable and untenable, both in principle and practice, and if you will allow me space I will endeavor to show the logic of my position.

We are told that the medical fee should be in reasonable proportion to the premium received, and again that the policy holder can afford to pay but a small medical fee when the application is for a small amount, while on larger policies a larger fee can be allowed.

Such a position is untenable, because it implies that the medical fee bears a fixed relation to the face of the policy, whereas the muchly quoted "Section 97" of the new legislation specifically states that certain (4) expense items (among them medical examinations) incurred in securing new business shall not exceed in the aggregate the total loadings and mortality gains.

The law does not require or assume, as a graded fee bill would imply, that a company's policy shall be kept in classes according to their respective sizes, together with an expense account for each class. On the contrary, the law clearly contemplates that the tabulated amount of all premiums received on new business in any given calendar year shall be used as a basis for reckoning the aggregate amount of available for the (4) expense items named in "Section 97."

The loading and mortality gains as provided for in the new legislation are substantially the same on each $1,000 of insurance, and are just fifty times as much on an insurance of $50,000 as on an insurance of $1,000. Moreover, it matters not whether the insurance of $50,000 is on one life or on fifty lives, or on any number of lives between one and fifty.

Now, then, if it be true that the medical fee should be in reasonable proportion to the premium received, and if the policy holder can afford to pay but a small fee on small applications and a larger fee on larger applications, we can not escape the logical conclusion that the medical fee should be ten times as much on a policy for $30,000, for example, as on a policy for only $3,000. While the premises wholly justify the foregoing conclusion and no other, such a system would be manifestly unequitable to every interest involved.

Every premium is made up of three elements, viz., mortality fund, reserve fund and the expense fund, which is called loading. The first two are fixed by law and are the same for all companies operating on the same per cent. basis. Each company fixes its own loading, but it is approximately the same with all companies. The mortality gains are regulated by statistics and are substantially the same with all companies. On the standard forms of policies provided for in the new legislation, the "total loadings and mortality gains" equal from .65 to .75 per cent. of one annual premium.

From the foregoing facts we find that, in securing new business, any company may legally pay to its soliciting

agents, its inspectors of proposed risks and its medical examiners a sum of money equal in the aggregate to about 75 per cent. of the tabulated amount of all its first-year premiums. Moreover, while the companies may arbitrarily pay less than the amount named for the items mentioned, they can not pay more, and in fixing the amounts apportioned to agents, inspectors and examiners, respectively, they are bound by no law. It is unquestionably true, as shown above, that the medical fee bears no relation whatever either to the premium or to the face of the policy, but that the total amount paid to examiners is charged to a general expense fund.

The service required is, and very properly should be, equally thorough and uniform in all cases irrespective of the amount of the application. An examination made by any physician worthy of the trust and confidence placed in him by the company he represents will be just as complete and dependable in $1,000 cases as in cases of any other larger amounts.

I maintain that every feature of the entire subject warrants a uniform fee for a uniform service, the one commensurate with the other. If a uniform fee of $5 would amount in the aggregate to a sum out of proportion to the aggregate amount of premiums received, then it should be placed at a lower figure, provided always that it should be uniform just so long as the service is uniform.

In cases where large amounts are applied for, the interest of the company would be better subserved by having the opinion of two examiners, paying each the original uniform fee, instead of paying one physician $7.50 or $10 for the same service and the identical opinion which, in smaller cases, would be rendered for a smaller fee.

In other instances where additional urinalyses are required, or a microscopic analysis of the urine or sputum is desired, reasonable extra compensation should be allowed.

In the foregoing remarks it has not been my intention to say or imply that the aggregate amount paid by companies having a graded fee bill is less than it should be, but it has been my purpose to criticise any sort of a graded medical fee bill as being a wholly unequitable method of distributing this compensation.

Having clearly shown, it seems to me, that all the essential conditions connected with the subject warrant a uniform fee for a uniform service, let us see if a uniform medical fee of $5 is excessive. We have shown that the new legislation will allow the companies in securing new business to pay to their agents, inspectors and examiners a sum of money equal in the aggregate to about 75 per cent. of the aggregate amount of the first annual premiums.

Policies vary in amount from $1,000 to $1,000,000, but the amount of the average policy is not less than $2,000, being at the end of the year 1905 for the Equitable $2,605, for the Mutual Benefit, $2,301; for the Mutual Life, $2,306; for the Massachusetts Mutual, $2,241; for the Manhattan, $2,144; for the Penn Mutual, $2,354, and for the Provident Savings, $2,230; but for illustration we will place the amount of the average policy at only $2,000. The average premium for each $1,000 of insurance on the standard forms of policies provided for in the new legislation is not less than $30. Now, then, we have found that the average premium on the average policy is not less than $60. We have shown that the "loading and mortality gains" equal about 75 per cent. of the premium, which on the average policy is $45. On each (average) policy written the company will have not less than $45 to be paid to the agent, the inspector and the examiner.

Now, deduct $1 for the inspector, $5 for the examiner and $1 to help create a fund to pay the inspector and examiner in cases of rejected applications. The net result will be $38 for the agent's commission, which is equal to more than 60 per cent. of the premium. Moreover, the new law allows from three to nine agency renewals aggregating 65 per cent. of one annual premium.

The above figures may not be technically accurate in every particular, but they are substantially correct. They clearly demonstrate that a uniform fee for a uniform service may be reasonably and justly placed at $5.

Before closing, let me call attention to one illustration. The Equitable and the Mutual Benefit operate on the same per cent. basis, hence the mortality and reserve funds are the same (made so by law) for each company Each company arbitrarily fixes its own loading.

On a twenty-payment life policy at age of 35, the Equitable charges a premium of $38.34, while the Mutual Benefit charges only $36.22. On each $1,000 of insurance, then, the Equitable collects from the policy holder $2.12 for expenses more than does the Mutual Benefit on the same policy at the same age. But the Mutual Benefit pays a uniform medical fee of $5, while the Equitable allows a fee of only $3 on applications of $3,000 and less. Consequently, on each $1,000 policy as illustrated, the Equitable has of the premium, after paying the medical fee, $4.12 more than does the Mutual Benefit. While this difference alone is equal to 11 per cent. of the premium, the Mutual Benefit has an enviable reputation for paying large annual dividends to its policy holders.

A. SQUARE DEAL, M.D.

Medical Fees in Country Practice.

PHILLIPSBURG, KAN., Oct. 15, 1906.

To the Editor:—I was very much interested in the article under the above caption which appeared in THE JOURNAL, Oct. 6, 1906, by Dr. W. O. Bridges.

Having been a country practitioner for almost 14 years, I can verify his statements regarding the small fees of country physicians. The charges in western Kansas do not differ materially from those in Nebraska or Iowa. Why the fees are so inadequate can be explained by cut prices and superficial medical training.

The question that interests most of us, however, is how to raise our fees sufficiently to inspire respect and confidence on the part of the laity. Dr. Bridges suggests that this can be attained by organization and a fee schedule. I do not believe that it can be accomplished in that way. In the first place all physicians do not have so keen a moral sense as they ought to have, and many will violate the fee agreement and make low fees. It is fact and not a theory that confronts us. In the second place, the same fee ought not to be charged by two physicians, one of whom has a very meager education, poor equipment and a "stand-pat" policy, while the other has up-to-date text-books, modern equipment, and makes a careful, conscientious study of every case entrusted to him. If these two physicians were called to treat a serious case in the country, would it be fair or just to hold them down to a charge of 50 cents a mile, because perchance the schedule said to do so? Is their skill the same? Would their advice be worth the same?

The fees charged should be based on merit. Every case should stand alone, and the charge should be made according to the seriousness of the condition, the responsibility assumed, the time consumed in its treatment, and the skill displayed. Why should a physician charge less for his advice, when human life is in the scale, than a lawyer for his, where the latter's advice involves a question of property worth from $300 to $500?

To illustrate: A farmer has trouble with a neighbor over the ownership of a calf or shoat. One or both consult a lawyer; he listens, collects a retainer fee of $10 or $15, and tells him he will take the case under advisement. The same farmer is taken ill, a physician is called and responds, plods through six or seven miles of mud, and the farmer makes a roar because the physician makes a charge of $5. Why? Because the schedule says 50 cents a mile one way.

The lawyer has the farmer educated on the fee question; the physician has not. The condition will never become better until our patrons are taught that the charge is not for prescription, medicine or livery, but for knowledge and skill. Let us charge fair fees and, having charged, let us deliver the goods.

D. D. HAGGARD, M.D.

Report of Relief Committee of Physicians of San Francisco.

SAN FRANCISCO, Oct. 25, 1906.

To the Editor:—I regret to notice that in its report, published in THE JOURNAL, Oct. 20, 1906, page 1311, the relief committee of physicians of San Francisco has omitted numer-

ous contributions of books and surgical instruments made by physicians in various parts of the United States. I would mention also that the firm of Saunders & Co., of Philadelphia, donated books to the value of about $1,200. The instrument dealers and book dealers of San Francisco made liberal discounts, practically to the value of their own commissions, for the benefit of physicians accredited by the physicians' committee. The above gifts were appreciated by the physicians quite as much as contributions in money.

EMMET RIXFORD,
Treasurer, Physicians' Relief Fund.

Pharmacology

URON AND THIALION.

Report of the Council on Pharmacy and Chemistry, A. M. A.

The following reports were submitted to the Council by subcommittees which examined Uron (Uron Chemical Company) and Thialion (Vass Chemical Company):

To the Council on Pharmacy and Chemistry:

The following report on Uron is herewith submitted.

Uron is sold by the "Uron Chemical Co., Box A, St. Louis, Mo." In the literature distributed to physicians and in advertisements appearing in current medical journals $LiC_{13}H_7N_4O_2$ is given as the chemical formula of Uron.

According to analyses, this article is not a chemical compound, but is a mixture of lithium benzoate and hexamethylenamin[1] in approximately the following proportions:

Lithium benzoate	58 per cent.
Hexamethylenamin	42 per cent.

It is recommended that Uron be refused recognition and that this report be published.

To the Council on Pharmacy and Chemistry:

We beg leave to report on Thialion as follows:

Thialion is sold by the Vass Chemical Co., Danbury, Conn. In the literature supplied to physicians and in the advertisements in medical journals. Thialion is stated to be "a laxative salt of lithia" with the chemical formula "$3Li_2O.NaO.SO_3.7HO$." "Sodio-trilithic anhydrosulphate" is given as a synonym. An elaborate graphic or structural formula is also given.

According to analyses, this preparation is a mixture consisting chiefly of sodium sulphate and sodium citrate with very small amounts of lithium, the average of several estimations indicating the following composition:

Sodium citrate	58.6
Sodium sulphate, anhydrous	26.6
Sodium chlorid	3.3
Lithium citrate, anhydrous	1.8
Water	9.7

Thus, the advertising literature is a deliberate misrepresentation of the facts. It is, therefore, recommended that the preparation be refused recognition, and that this report be published.

The recommendations of the subcommittees were adopted by the Council and in accordance therewith the above reports are published.

W. A. PUCKNER, Secretary.

In publishing the above report, the Council is presenting to the medical profession another object lesson, and one that illustrates how easily our profession is being humbugged. There are several things that we may learn from the report on these two nostrums, but at this time we will take up only one phase of the lesson. Many of the scientific chemical compounds and derivatives given us by the German chemists have been distinct advancements and have proved to be valuable additions to our therapeutic agents; further, they were received with so much favor by physicians that they have been profitable for those who made them. It is not strange, therefore, that imitators should appear. One of the first was our old friend, Antikamnia (which was introduced as a "new synthetical" compound). This was followed by Ammonol, Phenalgin, Salacetin, and a host of others having acetanilid as their principal ingredient.

But there are hundreds of other so-called "new chemical" compounds among the "ethical" proprietaries on the market aside from the acetanilid mixtures. These wonderful compounds, by the mysterious union of their ingredients, possess therapeutic properties different from, or more powerful for good than, the drugs from which they are made. At least, this is what we are told, and this is what many believe or they would not sell so well.

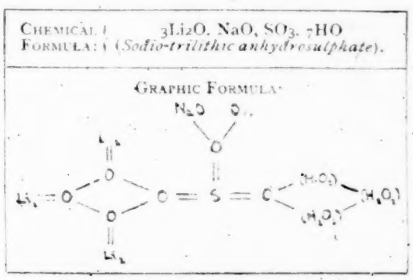
There is another factor worth noting connected with this subject: When to the claim that the mixture is a "chemical compound" is added a complex chemical formula, it prevents the impertient question, "What is it?" For isn't the "formula" there, and is not the information given without the asking? Most of us have been so overcome by the display of the chemical knowledge of the nostrum maker that we have been afraid to expose our ignorance by asking for information or explanation. And thus the promoter avoids perplexing questions, which, if answered truthfully, would spell bankruptcy.

URON.

The Uron Chemical Company informs us, concerning Uron, that it has the chemical formula of $Li\,C_{13}\,H_7\,N_4\,O_2$. Now this formula looks very dignified and scientific to those who are not up in chemistry. To the chemist, however, the formula signifies nothing. A few simple tests reveal the composition of the mixture, and it is surmised that the "formula" is the result of an attempt to combine the formulas of the two ingredients i. e., $LiC_7H_5O_2$ and $C_6H_{12}N_4$, the addition being faulty.

THIALION.

In regard to Thialion, the formula furnished by the Vass Chemical Company is even worse. To a physician who possesses but little knowledge of chemistry it will seem impressive, and he may absorb the idea that it stands for a preparation that is the result of exhaustive scientific research. To the chemist, this formula will appear as a jumble of symbols and numbers that mean nothing.



This picturesque "graphic formula" for Thialion appears with many of the advertisements. To most of us it looks formidable, wonderfully and deeply scientific and non-understandable; to a chemist it looks absurd.

It is not worth while to call attention to the simplicity of this simple mixture of ordinary salts, for it is too self-evident. As to the remarkable therapeutic qualities of Thialion, the reader is referred to that ably edited "scientific" periodical, the *Uric Acid Monthly*, and to the mass of "literature" relating to this wonderful remedy.

While there is a ridiculous side to this business, there is also a serious one. Those who have been making money out of us undoubtedly laugh in their sleeves at our gullibility, but to us as members of a presumably learned and intelligent profession, it is not a laughing matter. The whole nostrum business is a shame and a disgrace.

Ministers and "Patent Medciines."

Ministers of the gospel are much to blame for the use of "patent medicines," for they have been as liberal as any class of people in giving testimonials. Once in a while, however, the minister sees the matter in a true light, and is not afraid to preach on the subject.

1. We once more remind our readers that hexamethylenamine is the absurdly long but official name for the article that is sold under the proprietary names: Urotropin, Formin, Cystogen, Aminoform, Hexamin, Uritone, etc.

Rev. J. W. Perry, a Methodist minister of Knoxville, Tenn., is one of these. He recently preached a sermon, which in part is published in the Knoxville (Tenn.) *Journal and Tribune*, September 11, and from this we quote:

"It has been shown that many leading and popular brands often advertised as non-alcoholic were many of them stronger than 'good Scotch rye,' some of them having only some coloring, some deodorizing or other substance to change appearance, smell or taste. Others contain opiates and other poisons which cultivate the drug habit and which doubtless are responsible for multitudes of the so-called 'dope fiends.'

"The methods of some of these people who make 'patent medicines,' in securing testimonials, amounts in many instances to pure fraud. I saw a letter to one of our leading physicians illustrating their methods. A gentleman was made to declare himself to be past 100 years of age and in good health, due to the taking of a certain brand of patent stuff. Inquiry revealed the man in question was an ignorant negro, possibly 55 or 60 years of age, who had been given a bottle and supposed to have signed a receipt for it.

"The 'patent-medicine' habit is one that grows because of the whisky and 'dope' in the popular varieties. Many ministers have been deceived. The makers tell you the dose and when written to usually say 'increase the dose.' I have heard physicians of honor, Christian men, who would not cast a reflection on the clergy, declare that they had found ministers in whom they had all confidence, suffering from acute alcoholism due to the use of 'patent medicine.' I have known a minister to fall and become a drunkard, as he declared, through the use of 'patent medicine.' He stayed drunk on the stuff whole days at a time.

"Let the states follow up the pure-food legislation so that we may know what we get. If you need whisky as a medicine, get it and take it as you would strychnin, arsenic, belladonna, opium or morphin. But let some physician tell you you need it."

The Debasing Influence of Proprietary Medicines.

We quote the following from the presidential address of Dr. D. C. Gore, of Marshall, Mo., before the Missouri State Medical Association, as published in the *Journal of the Missouri State Medical Association*, July. The whole address is worth quoting, but we have space for the following only:

"That man who waits for the representative of some proprietary medicine to come in and tell him what to give his patients possibly may escape being classified as a charlatan, but he certainly has very little respect for his own professional attainments and voluntarily surrenders his learning, his privileges and his duties to some one else who knows absolutely nothing of his case. With the subletly of an Iago, the proprietary medicine man steals the wealth, position and reputation of an unsuspecting profession and supplants professionalism with a damning commercialism, all because physicians allow it and are controlled by a habit which they 'disdain to control'; he comes with a pleasing smile and presents you with a bottle of Gastritico, Hepatica or Duodenatica with his positive opinion that it will cure your patient, and you are assured it will because it bears the name of the organ affected; and, of course, it works, it just can't help it, and there you are, your individuality gone, your attainments sacrificed, your professional acumen handed over to organized greed.

"'Eternal vigilance' is not only 'the price of liberty' in affairs of state, but in the medical profession as well. It is high time that we should shake off the lethargy which this practice begets, and assert our privilege to practice our noble profession in our own way and give to our patients the benefit of our own knowledge and not turn them over to the greedy maw of a soulless corporation which makes stuff to sell.

"It is my honest belief that proprietary medicine is doing more to undermine professionalism to-day than all other influences combined; it lulls the doctor to sleep with the insidious proposition that will do his thinking for him, and eases his conscience with the unction that he has done the best possible thing for his patients because he has medicated them with a nostrum which is backed up by a corporation with lots of money behind it, and it would not, of course, spend its money on the remedy unless it was a good thing—for the corporation. Either this nefarious business must be stopped or professionalism is dead, and the erection of high standards of culture of medical men worse than a useless waste of time and money. The remedy lies at our own door and only requires a negative action on our part to effect a perfect cure. Stop prescribing them; your patients will stop taking them and their manufacture will suddenly cease. Their proprietors rely on us as their active agents for the sale of their products, and if we cease our participation in the spread of the business the only possible middle man between the manufacturer and the people has been removed and there is no longer possibility of contact."

Book Notices

IN THE YEAR 1800. By S. W. Kelley, M.D. Being the Relation of Sundry Events Occurring in the Life of Dr. Jonathan Brush During that Year. Vol. III of The Doctor's Recreation Series. Cloth. Pp. 421. Price, $2.50. Akron, Ohio: The Saalfield Publishing Company.

The Doctor's Recreation Series, as the name indicates, is a series of books for doctors, and is to consist of facts and fiction, as well as of medical history. This book, by Dr. S. W. Kelley, is one of the fiction volumes and, in a sense, is a historical novel. The history is a brief one as far as the time covered is concerned, only one year, 1800, being included in all that appeared in the over 400 large pages of the book. The scenes are laid in a small country town in Maine and in Philadelphia. In the former the writer (the story being in the form of an autobiography) is a country doctor, and one of his patients—a beautiful woman, of course—is murdered. Around this patient and her murder is woven the plot of the story. The doctor goes to Philadelphia later to get his degree and to practice. Several well-known medical men of a century ago, such as Drs. Shippen and Rush, are brought in. There is just enough history, just enough medicine and just enough plot to make the story instructive, interesting and readable, especially to physicians.

DIET AND DIETETICS. By A. Gautier. Edited and Translated by A. J. Rice-Oxley, M.A., M.D. Cloth. Pp. 552. Price, $3.50. Philadelphia: J. B. Lippincott Company, 1906.

This translation appears to have been made from the second edition of the original (Paris, 1904). The book consists of three parts: Principles and Methods, Aliments, Regimens. Many questions of importance to health and to medical and sociologic problems are discussed in an interesting and instructive manner, and physicians may look with confidence to this book for much valuable information in regard to diet and dietetics, the general interest in which appears to be increasing. Atwater's researches in regard to the requirements in energy by man at rest and at work are drawn on freely, but Chittenden's recent studies on the physiology of nutrition do not appear to have been utilized, presumably because they were not available for this edition. The translation reads smoothly.

HEALTH-CARE OF THE BABY. A Hand-book for Mothers and Nurses. By L. Fischer, M.D., Author of "Infant Feeding in Health and Disease"; "A Text-book on Diseases of Infancy and Childhood," etc. Cloth. Pp. 144. Price, 75c net. New York: Funk & Wagnalls Company, 1906.

This book is intended, as the title states, for the use of mothers and nurses, but it contains many points of interest to the physician. The details of ventilation of the baby's room, its clothing, bathing and feeding are considered. In regard to artificial feeding Fischer states that each child is a law unto itself, a fact that many physicians are inclined to overlook. The chapters on the care of infants and young children in disease, accidents and poisonings, and on correction of bad habits are commendable.

THE EXTRA PHARMACOPEIA OF MARTINDALE AND WESTCOTT. Revised by W. H. Martindale, Ph.D., F.C.S., and W. W. Westcott, M.B., D.P.H. Twelfth Edition. Flexible Leather. Pp. 1045. Price, $4.20. London: H. K. Lewis, 1906.

This book seems to contain a great deal of valuable information and might well be called a pocket dispensatory. Unfortunately, however, it relates chiefly to British preparations

and, therefore, is of more interest to British than to American physicians. The chapter on organotherapy takes up preparations of the duodenal mucous membrane, and of the suprarenal and thyroid glands, and the method of treatment by the inspissated milk and blood of thyroidectomized animals.

NOTES ON SURGERY FOR NURSES. By J. Bell, M.D., F.R.C.S., Edin., Consulting Surgeon to the Royal Infirmary, and to the Royal Edinburgh Hospital for Sick Children. Sixth Edition, thoroughly revised. Cloth. Pp. 187. Price, $1.50 net. New York: William Wood & Co.

This book has been revised to date and an appendix added concerning "The Relations of the Nurse to the Profession and to the Public." The book relates to conditions in Great Britain which are slightly different from those on this side of the Atlantic. The remarks concerning the nurse's deportment in hospitals and in private practice, however, might be read with advantage by nurses everywhere.

Marriages

HERBERT W. KNAPP, M.D., to Miss Mae Powers, both of St. Louis, Mo., October 16.

HENRY FLANNERY, M.D., to Miss Mary Donahue, both of Philadelphia, October 17.

FREDERICK T. FAHLEN, M.D., to Miss Olive M. Cuthbert, both of St. Louis, October 10.

LOIS WORTHINGTON, M.D., and Frank Davis, both of Bakersfield, Cal., October 15.

RUFUS T. DORSEY, JR., M.D., to Miss Laura Witham, both of Atlanta, Ga., October 16.

JAMES IRVIN, M.D., to Miss Kathryn Rose Patton, both of Danville, Va., October 17.

CHARLES WERT, M.D., Wallace, Ind., to Miss Ethel McCann of Indianapolis, October 24.

FRANK E. BROWN, M.D., to Miss Bessie Humphreys Sherk, both of Baltimore, October 18.

IRA C. HARRIS, M.D., Braddock, Pa., to Miss Emma Snowden of Duquesne, Pa., October 23.

GEORGE A. SEYBOLD, M.D., Jackson, Mich., to Miss Gertrude M. Vliit of Detroit, October 25.

NORMAN L. MCDIARMID, M.D., to Miss Mary Alice Root, both of Dayton, Ohio, October 17.

HARTWELL A. SIBLEY, JR., M.D., to Miss Margaret A. White, both of Stoughton, Mass., recently.

ROBERT ROY HOPKINS, M.D., Mathews, Va., to Miss Bessie Dale Miller, at Baltimore, October 17.

WILLIAM C. MEBANE, M.D., Mount Airy, N. C., to Miss Susan Mott of Charlotte, October 11.

J. CAJETAN FLYNN, M.D., Philadelphia, to Miss Florence Mahoney of New York City, October 11.

C. ALLAN PORTER, M.D., Rockland, Mass., to Miss Isabelle M. Thomas of Middleboro, Mass., October 24.

RICHARD F. SHAHAN, M.D., Eddyville, Iowa, to Miss Gertie B. McCombs of Agency, Iowa, October 17.

FLETCHER W. GALLOWAY, M.D., Cottonwood, Ala., to Miss Annie Thrasher of Dothan, Ala., October 17.

HARRY L. POLLACK, M.D., Chicago, to Miss Mabel Hirsch of Burlington, Iowa, at Chicago, October 14.

LEOPOLD BAUER, M.D., Syracuse, N. Y., to Miss Marie Rebecca Jurgens of Brooklyn, N. Y., October 9.

ROBERT JAMES CURDY, M.D., Kansas City, Mo., to Miss Annie Richardson Hall of Lawrence, Kan., November 3.

ALBERT KEIDEL, M.D., Baltimore, to Miss Janet Gordon Van Smith of New York City, at Baltimore, October 15.

ARTHUR H. BUCK, M.D., Delaware, Ohio, to Miss Jennie Lind Hartje of McComb, Ohio, in Findlay, Ohio, October 16.

THEODORE MADDOX, M.D., Union, S. C., to Miss Mary Murphy of Pinckney Township, Union County, S. C., October 10.

THEODORE B. BLISS, M.D., Schenectady, N. Y., to Miss Helen Cory of Swampscott, Mass., in Cleveland, Ohio, October 17.

WILLIAM H. MOORE, M.D., Viola, Tenn., to Mrs. Lyda W. Hearn of Woodbury, Tenn., in Nashville, Tenn., October 17.

WILLIAM A. FISHER, JR., M.D., Baltimore, to Miss Annie Courtney Baylor, at Staunton Hill, Charlotte County, Va., October 17.

Deaths

John Harrison Blanks, M.D. Medical College of Alabama, Mobile, 1874; College of Physicians and Surgeons in the City of New York, 1876; of Meridian, Miss.; one of the most eminent physicians of Mississippi; president of the Meridian board of health in 1899, and a year later president of the Nashville (Tenn.) Medical College; a member of the faculty of the Mississippi Medical College, Meridian, and of the Lauderdale County Medical Association, died in the Touro Infirmary, New Orleans, October 19, after an operation, aged 52.

Alphonso Bickford Brown, M.D. Harvard University Medical School, Boston, 1898; of Newburyport, Mass.; a member of the Peary relief expedition to the Arctic; a member of the Massachusetts Medical Association and of the attending staff of the Anna Jaques Hospital, died suddenly from heart disease at the Anna Jaques Hospital, Newburyport, October 17, two weeks after an operation for appendicitis, from which he was apparently recovering, aged 34.

Malvern N. Due, M.D. College of Physicians and Surgeons in the City of New York, 1888; a member of the American Medical Association, Medical Association of the State of Alabama and Jefferson County Medical Society; a member of the United States pension board; for some time city physician, and one of the most prominent physicians of Birmingham, Ala., died in Mobile, October 20, after a long illness, aged 39.

James E. Stewart, M.D. Hospital College of Medicine, Louisville, 1883; one of the founders of Stewart Hospital, Hutchinson, Kan.; a member of the Reno County Medical Society, died at his home in Hutchinson, October 14, from pneumonia, after an illness of six days, aged 48. At a meeting of the medical profession of Hutchinson a committee was appointed to draft resolutions in memory of Dr. Stewart.

William Walton Fuqua, M.D. Medical College of Virginia, Richmond, 1859; surgeon in the Confederate service during the Civil War, and at one time on duty at Libby prison, Richmond; formerly a practitioner of Hopkinsville, Ky.; from 1884 to 1887 professor of anatomy in the Hospital Medical College, Memphis, Tenn., died at his home in Jonesboro, Tenn., October 18, aged 68.

Charles P. Russell, M.D. Bellevue Hospital Medical College, New York City, 1874; a member of the Oneida County Medical Society; consulting dermatologist to Faxton and St. Elizabeth's hospitals, Utica, and visiting dermatologist to the Utica General Hospital, died at his home in Utica, from pneumonia, October 26, aged 58.

Charles Samuel Williamson, M.D. College of Physicians and Surgeons in the City of New York, 1891; of Brooklyn; a member of the American Medical Association and of the Kings County Medical Society, died at Rainbow Lake, in the Adirondacks, October 21, after a short illness, aged 37.

Herbert S. Jones, M.D. New York Homeopathic Medical College and Hospital, 1888; physician to the Bergen County Almshouse, died at his home in Oradell, N. J., October 18, as the result of injuries received in a fall several weeks before, in which he sustained a fracture of the skull, aged 54.

Arnon Lyon Comstock, M.D. New York University, New York City, 1904; a member of the Medical Society of the State of New York, and of the Herkimer County Medical Society, died at his home in Ilion, N. Y., October 17, from tuberculosis after an illness of more than a year, aged 26.

Algernon Sydney Epes, M.D. Jefferson Medical College, Philadelphia, 1858; surgeon in the Confederate service during the Civil War; poor physician of Nottoway County, Va., died at his home in Nottoway Court House, October 19, after an illness of several weeks, aged 70.

Reuben T. Laycock, M.D. Eclectic Medical Institute, Cincinnati, 1874; for 10 years professor of diseases of women and children at the Indianapolis Eclectic Medical College, died at his home in that city, October 22, from valvular heart disease, after a long illness, aged 56.

Alva L. Hudders, M.D. Jefferson Medical College, Philadelphia, 1886; of Philadelphia, was killed October 28, in an accident on the electric line between Philadelphia and Atlantic City, when a train was thrown from the drawbridge into the waterway at Atlantic City.

Paul F. Felsberg, M.D. Hahnemann Medical College, Philadelphia, 1901; of Philadelphia, was killed October 28, in an accident on the electric line between Philadelphia and Atlantic City, when a train was thrown from the drawbridge into the waterway at Atlantic City.

Russell G. Andrew, Jr., M.D. Medico-Chirurgical College of Philadelphia, 1898; coroner of Monmouth County, New Jersey, for three years, died at his home in Highlands, October 19, from pneumonia, after an illness of two weeks, aged 30.

J. S. Grubbs, M.D. University of Louisville, Medical Department, 1866; a surgeon in the Confederate service during the Civil War, and one of the oldest practitioners of Hopkinsville, Ky., died at his home, October 20, aged 74.

Robert Coulter Banks, M.D. Rush Medical College; a veteran of the Civil War; for many years a practitioner of Owatonna, Minn., died at his old home in Pine Island, Minn., September 1, after an illness of three days, aged 69.

Harrison H. Power, M.D. Geneva (N. Y.) Medical College, 1850; one of the oldest practitioners of Ionia County, Michigan; a veteran of the Civil War, died at his home in Saranac, Mich., October 20, aged 79.

William Alfred Cassidy, M.D. University of Vermont, Medical Department, Burlington, 1905; of Russell, Mass., died at the home of his father in Rutland, Vt., October 10, from tuberculosis, aged 28.

Gustave Vetter, M.D. St. Louis College of Physicians and Surgeons, 1884; health officer and member of the board of education of Belleville, Ill., died suddenly in that city, October 25, aged 53.

W. Updyke Selover, M.D. New York University, New York City, 1874; mayor of Rahway, N. J., for two years, and water commissioner, died at his home in Newark, N. J., October 16, aged 63.

Joseph C. Mull, M.D. Atlanta (Ga.) Medical College, 1893; vice-president of Floyd County Medical Society, died at his home in Rome, Ga., from typhoid fever, October 24, aged 39.

John W. Stockton, M.D. Eclectic College of Medicine, Cincinnati, 1877; of Washington, Pa., died in the Washington Hospital, October 19, after an illness of two years, aged 58.

Walter L. Hall, M.D. Bellevue Hospital Medical College, New York City, 1868; of Medford, Mass., died recently at a hospital in Medford, after an operation for appendicitis, aged 60.

Virgil Weir, M.D. University of Michigan Homeopathic Medical College, Ann Arbor, 1904; of Toledo, died at his home in Warren, Ohio, October 18, from tuberculosis, aged 27.

P. Alvin Dix, M.D. Fort Wayne (Ind.) College of Medicine, 1880; for many years a practitioner of Paulding, Ohio, died at the Ohio State Hospital, Toledo, October 13, aged 56.

David M. Claitor, M.D. Memphis Hospital Medical College, Memphis, Tenn., 1900; of Kosciusko, Miss., was shot and killed by Dr. John H. Love, August 27, at Kosciusko.

Edward R. McMullin, M.D. Vanderbilt University, Medical Department, Nashville, 1885, died at his home in Maben, Miss., September 12, after a long and painful illness.

Bernhardt Fincke, M.D. New York University, New York City, 1854, died at his home in Brooklyn, October 21, after an illness of a year, from senile debility, aged 85.

Dudley S. Laws, M.D. University of Nashville, Medical Department, 1873, died suddenly from heart disease at his home in Clarksburg, Tenn., October 19, aged 79.

William H. Carothers, M.D. Medical College of Ohio, Cincinnati, 1878, died suddenly at his home in Melrose, Mass., recently, from hemorrhage, aged 52.

Edmund Moore, M.D. Dalhousie University Medical Faculty, Halifax, N. S., 1874, died recently at Salisbury, N. B., where he had practiced for 32 years.

Frank W. Schuessler, M.D. University of Maryland School of Medicine, Baltimore, 1890, died at his home in Canton, Baltimore, October 16, aged 40.

E. B. LeFevre, M.D. Medical College of Ohio, Cincinnati, 1889; of Abilene, Kan., died from hemorrhage of the lungs in Danville, Ill., October 21.

Helen McAndrew, M.D. Hygeio-Therapeutic College of New York, New York City, 1853, died at her home in Ypsilanti, Mich., October 28, aged 85.

Timothy S. Foster, M.D. Medical School of Maine at Bowdoin College, Brunswick, 1862, died at his home in Laconia, N. H., October 24, aged 78.

Daniel Janney, M.D. Hahnemann Medical College, Philadelphia, 1850, died at his home in Grimes, Va., October 15, aged 79.

Duncan Sinclair, M.D. University of Maryland School of Medicine, Baltimore, 1855, of Rowland, N. C., died recently, aged 84.

Francis M. Richardson, M.D. Eclectic Medical Institute, Cincinnati, 1876, died at his home in Chicago, October 24, aged 75.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Queries for this column must be accompanied by the writer's name and address, but the request of the writer not to publish name or address will be faithfully observed.

TREATMENT OF SCALP WOUNDS.

———, ———, Oct. 18, 1906.

To the Editor:—What is the treatment in the case of scalp wounds made by indirect violence, such as the head striking gravel on the road and in which in addition to one or more lacerated wounds, say two inches long, the scalp is separated from the skull, but not detached. In the case referred to, the periosteum of the skull has sloughed off, owing to the contusion it received. There is an area adjacent to the wound and about half the size of the same, where the skull is bare, but is covered by the scalp. In response to peroxid of hydrogen and copious irrigation of the pockets with antiseptic solutions, the wounds can be kept clean, yet no great advance is made toward a rational and satisfactory result. I have been unable to find any information regarding such a condition in any standard text-book on surgery. A. B. Z.

ANSWER.—Our correspondent does not mention the length of time which has elapsed since the receipt of the injury, which is important in enabling one to form some idea of the present condition of the tissues. The important point in the case is, whether or not the bone has been so injured that necrosis has or will result. Mere separation of the scalp, including the periosteum, from the bone is not sufficient to produce death of the bone, as the soft parts may be replaced and perfect healing will result. Should the bone, however, be so seriously injured, or should infection of such a degree take place that death of the bone results, union between the scalp and the dead bone will not occur. Either the dead bone must be removed by the surgeon or one must await Nature's slow process of casting off dead bone. In the present case, free drainage should be established and the wound kept as surgically clean as possible. If the bone is not dead, as soon as the sloughing soft parts have cleaned up, the scalp will settle down and adhere to the skull again. If the bone is dead, it should be removed. Usually in such cases only the outer table is involved. As soon as all the dead bone, should any be present, is removed, the wound will close.

REQUESTS INFORMATION ABOUT DAYTON AUTOMOBILE.

SALT LAKE CITY, Oct. 27, 1906.

To the Editor:—Will any reader who has had any experience with the "Reliable-Dayton" automobile kindly give me his experience.

T. C. GIBSON, M.D.,
406 Tribune Bldg.

The Public Service

Army Changes.

Memorandum of changes of stations and duties of medical officers, U. S. Army, week ending Oct. 27, 1906:

Steer, Samuel L., asst.-surgeon, returned to Fort Assinniboine, Mont., from leave of absence.

Wales, Philip G., surgeon, left Fort Wayne, Mich., on leave of absence for ten days.

Rhoads, Thomas L., asst.-surgeon, left West Point, N. Y., for Fort Crook, Neb., his new station.

Maus, Louis M., deputy surgeon-general, returned from leave of absence to duty as chief surgeon, Department of Texas.

Duncan, William A., asst.- surgeon, arrived in San Francisco, for one month's leave of absence from the Philippines Division.

McCulloch, Champe C., Jr., surgeon, left Fort Meade, S. D., on leave of absence for one month.

Wadhams, Sanford H., asst.-surgeon, returned to Fort Slocum, N. Y., from detached service at Fort Mackenzie, Wyo.

Heysinger, James D., asst.-surgeon, granted an extension of sixteen days to his leave of absence.

Deshon, George D., surgeon, ordered to Rochester, Minn., for observation and treatment.

Lyster, Theodore C., asst.-surgeon, returned to Ancon Hospital, Canal Zone, from special leave of absence.

Ekwurzel, George M., asst.-surgeon, returned to Fort Keogh, Mont., from practice march.

Talbott, Edward M., asst.-surgeon, returned to Fort Leavenworth, Kan., from detached service at Kansas City, Kan., with troops.

Richardson, George H., contract surgeon, relieved from duty at the Depot of Recruits and Casuals, Angel Island, Cal., and ordered to duty at the Presidio of San Francisco.

McPheeters, Samuel B., contract surgeon, ordered from St. Louis, Mo., to Fort Robinson, Neb., for duty.

Kress, Clarence C., contract surgeon, ordered from St. Louis, Mo., to Fort Reno, Okla., for duty.

Cullen, Charles W., contract surgeon, ordered from Cincinnati, Ohio, to Fort Sill, Okla, for duty.

Stearns, Charles H., contract surgeon, relieved from duty at Fort Monroe, Va., and ordered to Fort Screven, Ga., for duty.

Branch, Frederick D., contract surgeon, granted leave of absence for two months, twenty-five day, with permission to go beyond sea.

Merrick, John N., contract surgeon, relieved from further duty at Fort Missoula, Mont., and ordered to Manila, P. I., for Philippine service.

Hull, Alva R., contract surgeon, ordered from San Francisco, to Fort Logan, Colo., with 21st Infantry, and thence to his home, Oconomowoc, Wis., for annulment of contract.

Newton, Ralph W., contract surgeon, ordered from New York City to Fort Niagara, N. Y., for duty.

Burkart, John L., contract surgeon, left Fort Sheridan, Ill., on leave of absence for one month.

Craig, Emmett J., dental surgeon, arrived at San Francisco, on leave of absence for one month from the Philippines Division.

Navy Changes.

Changes in the Medical Corps, U. S. Navy, for the week ending Oct. 27, 1906:

Drake, N. H., medical inspector, retired, placed on the retired list of officers of the Navy from Oct. 6, 1906.

Donelson, M., acting asst.-surgeon, to the U. S. Naval Medical School, Washington, for instruction.

Casto, D. H., acting asst.-surgeon, to the U. S. Naval Medical School, Washington, for instruction.

Decker, C. J., surgeon, granted sick leave of absence for three months.

Stitt, E. R., surgeon, to Naval Medical School.

Holcomb, R. C., P. A. surgeon, additional duty as quarantine officer at Culebra, W. I., for the purpose of inspecting Government vessels at that port.

Munger, C. B., asst.-surgeon, detached Naval Training Station, San Francisco; to U. S. S. *Supply*, Naval Station, Guam, L. I., sailing Nov. 5, 1906.

Public Health and Marine-Hospital Service.

List of changes of station and duties of commissioned and non-commissioned officers of the Public Health and Marine-Hospital Service for the seven days ending Oct. 24, 1906:

Gassaway, J. M., surgeon, granted leave of absence for ten days from Nov. 4, 1906.

Carrington, P. M., surgeon, granted leave of absence for seven days under provisions of Paragraph 189 of the Regulations, from October 23, 1906.

Carrington, P. M., surgeon, granted extension of leave of absence for fifteen days from Oct. 30, 1906.

Cumming, H. S., P. A. surgeon, leave of absence granted for one month from September 15, amended so as to grant him one month's leave from Oct. 4, 1906.

Anderson, J. F., P. A. surgeon, granted leave of absence for one month from Nov. 5, 1906.

Long, John D., P. A. surgeon, relieved from duty at Manila, P. I., and directed to proceed to San Francisco.

Alexander, E., acting asst.-surgeon, granted leave of absence for seven days from Nov. 1, 1906.

Fisher, C. E., acting asst.-surgeon, granted leave of absence for seven days from October 17, 1906.

Mason, W. C., acting asst.-surgeon, granted leave of absence for twelve days from Sept. 17, 1906.

Simonson, G. T., acting asst.-surgeon, granted five days leave of absence from Oct. 19, 1906.

Straw, E. E., acting asst.-surgeon, granted leave of absence for twenty days from Oct. 15, 1906.

Walker, T. D., acting asst.-surgeon, granted leave of absence for ten days from Oct. 18, 1906.

Gahn, Henry, pharmacist, granted leave of absence for twelve days from Oct. 22, 1906.

Holt, E. M., pharmacist, granted leave of absence for twenty-seven days from Oct. 26, 1906.

APPOINTMENT.

Dr. J. F. Blanchard was appointed a temporary acting asst.-surgeon for duty at Newport, Vt., in connection with the examination of alien immigrants.

Health Reports.

The following cases of smallpox, yellow fever, cholera and plague have been reported to the Surgeon General, Public Health and Marine-Hospital Service, during the week ended Oct. 26, 1906:

SMALLPOX—UNITED STATES.

Montana: Cascade County, Sept. 1-30, 1 case.
Oregon: Marion County, Sept. 1-30, 1 death.
Tennessee: Knoxville, Oct. 19-26, 1 case.
Texas: Houston, Sept. 29-Oct. 6, 1 case.
Utah: General, Sept. 1-30, 20 cases.

SMALLPOX—FOREIGN.

Africa: Cape Town, Sept. 1-8, 2 cases.
Argentina: Buenos Ayres, July 1-31, 99 deaths.
Canada: Winnipeg, Oct. 5-12, 3 cases.
France: Marseilles, Sept. 1-30, 12 deaths; Paris, Sept. 15-22, 2 cases, Sept. 29-Oct. 6, 2 cases.
Germany: Bremen, Sept. 29-Oct. 6, 1 case.
India: Bombay, Sept. 18-25, 1 death; Madras, Sept. 15-21, 3 deaths.
Italy: General, Sept. 27-Oct. 4, 1 case.
Russia: Moscow, Sept. 15-29, 6 cases, 2 deaths; St. Petersburg, Sept. 8-12, 4 cases, 2 deaths.
Siberia: Vladivostock, Aug. 21, 1 case.
Turkey: Constantinople, Sept. 30-Oct. 7, 1 death.

YELLOW FEVER.

Cuba: Havana, Oct. 19-21, 4 cases.
Guatemala: Gualan, Oct. 2, 4 cases.
Mexico: Merida, Sept. 30-Oct. 6, 4 cases, 4 deaths; Tustepec, 1 case, 1 death.

CHOLERA—INSULAR.

Philippine Islands: Manila, Sept. 8-15, 20 cases, 17 deaths; Provinces, 120 cases, 94 deaths.

CHOLERA—FOREIGN.

India: Bombay, Sept. 18-25, 21 deaths; Madras, Sept. 15-21, 80 deaths; Rangoon, Sept. 8-15, 1 death.

PLAGUE.

China: Hongkong, Aug. 25-Sept. 1, 1 case, 1 death.
Egypt: Alexandria, Sept. 21-25, 2 cases, 1 death; Suez, Sept. 21-27, 6 cases, 2 deaths.
India: General, Sept. 1-8, 4,304 cases, 3,134 deaths; Bombay, Sept. 18-25, 41 deaths; Karachi, Sept. 3-16, 18 cases, 16 deaths; Madras, Sept. 15-21, 1 death; Rangoon, Sept. 8-15, 1 case, 43 deaths.
Japan: Waykayama Ken, Oct. 2, present.
Mauritius: Aug. 8-24, 9 cases, 6 deaths.

Medical Education and State Boards of Registration

COMING EXAMINATIONS.

NEVADA State Board of Medical Examiners, Carson City, November 5. Secretary, S. L. Lee, Carson City.

NEBRASKA State Board of Health, State House, Lincoln, November 7-8. Secretary, Geo. H. Brash, Beatrice.

MAINE Board of Registration in Medicine, Portland, November 13. Secretary, Wm. J. Maybury, Saco.

CONNECTICUT Medical Examining Board, City Hall, New Haven, November 13-14. Secretary, Charles A. Tuttle, New Haven.

MASSACHUSETTS Board of Registration in Medicine, State House, Boston, November 13-14. Secretary, Edwin B. Harvey, State House.

WEST VIRGINIA State Board of Health, The Frederick, Huntington, November 13-15. Secretary, H. A. Barbee, Point Pleasant.

MISSOURI State Board of Health, Kansas City, November 26-28. Secretary, J. A. B. Adcock, Warrensburg.

Needed Reforms in the Medical Laws of the State of New York.—Under this head Dr. Frank Van Fleet, formerly chairman of the committee on legislation of the Medical Society of the State of New York, writes an interesting article in the October *Post Graduate*. This continues the effort to secure a single board of medical examiners. In regard to the defects of the present New York law, he says:

I am not in favor of so many laws as we, as a state, labor under to-day. The enactment of law is not ever a thing to be proud of, however necessary it may be. That we must have laws in the present condition of society is unfortunately too true; they are a sort of necessary evil, and being such ought to be as few and as simple as possible. Our present medical law, to my mind, is defective in the following particulars: First, it is cumbersome; second, it discriminates in favor of certain classes; third, it does not accomplish the purpose for which it was enacted; and fourth, it is unjust in its method of enforcement.

The first objection requires no argument, for all it is necessary to do is to read it and its cumbersomeness is apparent. I do not consider it is necessary to say more about this defect, nor would I consider it worth my time to criticise it if this was its only defect.

The second objection that the law discriminates in favor of selected classes, is a glaring defect, and almost sufficient, it seems to me, to warrant its repeal.

In regard to the second objection he shows that while there are three separate examining boards, the applicant does not necessarily appear before the board representing his school of practice, but may take his examination before any of the boards, since the examination is the same in all departments excepting in that relating to therapeutics and the treatment of disease. Referring to the fact that after a physician is once licensed no restrictions are placed on him as to what methods he is to employ, Dr. Van Fleet says:

This is, of course, as it should be. It would be impossible for a physician to act intelligently, or to do the best possible for his client in the treatment of disease, if he were limited to the employment of any single method. Indeed, an intelligent and conscientious physician would feel himself so hampered by a restriction of this kind as to be incompetent and unwilling to treat disease. . . . The greatest possible freedom must be permitted in the practice of the healing art if satisfactory results are expected, and even then, with all the methods of treatment, and all the remedies known to science at his command, the educated physician realizes his weakness and must at times admit himself baffled.

The present law has not worked to the disadvantage of the practitioners who have qualified under it; in fact, it has done more than anything else to break down the barrier which formerly existed between the practitioners of the various schools which these three boards represent. There is to-day practically no difference in the methods employed by the licensed physicians of this state in the treatment of disease.

But why have separate boards? If a separate board is to be allowed for every new sect in medicine which comes up, where will it end?

If homeopathy is recognized by the state, why not "osteopathy?" Is the state competent to discriminate between the truths of homeopathy and the fallacies of osteopathy? If not, why does the state accord to one the privilege it denies to another?

To ignore them, then, the state must flatly refuse to accord to one class of citizens privileges it accords to others, and this I do not believe the state will do. If this applies to homeopathy and osteopathy, why not to naturopathy, vitapathy, hydropathy, and so on? The state, in granting exclusive privileges to three classes of practitioners discriminates unjustly, unless provision is made for the recognition, as separate classes, of all other sects who are willing to comply with the requirements similar to (not necessarily identical with) those at present recognized.

Among other defects in the laws, Dr. Van Fleet reveals the failure to define clearly what the practice of medicine really is, and states the purpose of the law as follows:

The purpose was not to create or keep alive any particular system or method of practice, or to subsidize any school of medicine or to foster a monopoly. The purpose, pure and simple, was to protect the people of the State of New York from incompetent practitioners of the healing art. Lawyers and judges have been found whose minds are not broad enough to grasp this, and the former have urged, and the latter have ruled, that to practice medicine one must give drugs, and if one undertook to cure disease by any other method, the act did not constitute a violation of the statute.

So the law, by failing to give an accurate and clear definition of the term, has been used by unscrupulous or misguided people, to defeat the very purpose for which it was enacted. The law is unjust in the provision prescribed for its enforcement.

The author then shows that legal machinery of the state is not provided to enforce the law, this being left to the county societies. As to improvements in the law the author's suggestions are:

The present formation of the Board of Examiners I would do away with entirely. In its place I would substitute a single examining board, which would have nothing about it to indicate that it represented any school or schools of medicine. At a conference with the Department of Education last winter, in which I participated, one of the members of the department said, among other things, as I remember it, that if he or some member of his family was sick he would like to be able to call in some physician on whom the state had put its stamp of proficiency, without having to think anything about the school of practice the physician represented. What the layman desires when he is sick is to get well, and he wants this result accomplished in the simplest, most direct and safest way. He is not concerned about the method, whether it is regular or irregular, homeopathic or osteopathic. And the honorable physician will not let his patient suffer or die, or permit his cure to be delayed, because the best method of treatment is not the method of his school. I have always been glad that I was not the adherent of a "school" or a "method" of practice, but just an ordinary simple doctor, and the graduate of an ordinary simple medical college. I believe the time has arrived when there is no place for a doctor who calls himself by a peculiar title, or adopts a peculiar method of treatment, and from my conversation with members of the State Legislature, and of the State Department of Education, I believe this is the view which is coming to be generally accepted. So I would abolish separate boards of examiners and adopt a single board before which all applicants for the right to practice the healing art should appear, and when the person so applying had demonstrated his ability to recognize disease, and was reasonably familiar with the various methods of cure, I would grant him the right to practice. After that, if he wanted to call himself a homeopath or an osteopath or some other kind of a "path" that would be his individual concern.

How this single board should be appointed is one of the details to be worked out. I would favor the appointment of examiners by the governor of the state, or by the Department of Education, on the recommendation of universities having medical departments. I would advocate the passage of a law accurately defining the practice of medicine, or what would be better, defining the practice of the healing art, eliminating entirely the word "medicine," so that there could be no doubt in the mind of anybody that a person practicing this art for gain, who had not received from the state a certificate of proficiency, was a dangerous character, who should be put under restraint.

Finally, if it is necessary to have a separate organization to look after the enforcement of this law, as I am firmly convinced it is, I would advocate the formation of such a body composed of physicians and laymen, authorized by legal enactment to look after the enforcement of this and other laws affecting the public health, for there are other laws quite as important, and to this organization I would suggest that an annual appropriation should be made to carry on the work.

There was a bill introduced in the legislature of 1906, by the Assembly Committee on Public Health, which embodied some of the ideas I have attempted to express. It was known as Assembly Bill No. 1715. Something of this sort is sure to come to pass in the near future, and the medical profession should have a voice in it. The writing on the wall is very plain to many of us who have kept in touch with recent events. Changes are evidences of progress in this rapidly moving world of ours, and we can not stand still, for if we are not moving forward we are moving backward. If we would keep in the procession we must conform ourselves to the inevitable. Our present medical law does not meet the demands of the times, and it must be changed. The legislature and the Department of Education look to the medical profession to advocate such changes. Shall we recognize the inevitable and take the initiative, or shall we allow some other force to enter in and take the initiative while we stand aside?

Nebraska August Report.—Dr. George H. Brash, secretary of the Nebraska State Board of Health, reports the written examination held at Lincoln, Aug. 8-9, 1906. The number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75; candidates examined, 14; passed, 9; failed, 5. Eight reciprocal licenses were granted. The following colleges were represented:

PASSED.

College.	Year Grad.	Per Cent.
Northwestern Univ. Med. School	(1906)	89.5
College of P. & S., Keokuk	(1901)	80.7
Baltimore Med. Coll	(1906)	85.3
Harvard Med. School	(1902)	87
University of Nebraska	(1906)	85.5
Creighton Med. Coll	(1906)	75*, *79.2
Bellevue Hosp. Med. Coll	(1897)	80.1
Trinity University, Toronto	(1904)	80.8

FAILED.

College of P. & S., Indianapolis	(1905)	49.2
University of Nebraska	(1905)	†61.6
Creighton Med. Coll	(1906)	66*, *74
Western Med. Coll., London, Ont.	(1904)	72.6

REGISTERED THROUGH RECIPROCITY.

College.	Year Grad.	Reciprocity with.
Rush Med. Coll	(1886)	Iowa.
Northwestern Univ. Med. School	(1900)	Illinois.
Sioux City Coll. of Med	(1905)	Iowa.
Drake University	(1906)	Iowa.
Kentucky School of Med	(1905)	Kentucky.
University of Maryland	(1900)	Maryland.
Central Med. Coll., St. Joseph, Mo	(1905)	Kansas.
Western Reserve University	(1882)	Ohio.

* Second examination.
† Fifth examination.

Society Proceedings

COMING MEETINGS.

Mississippi Valley Medical Association, Hot Springs, Ark., Nov. 7-8.
American Public Health Assn., Mexico City, Dec. 3-7.
Southern Surg. and Gyn. Assn., Baltimore, Dec. 11-13.

BOSTON MEDICAL LIBRARY.

Meeting, held Oct. 17, 1906.

DR. RICHARD J. CABOT in the Chair.

Treatment of Bacterial Diseases by Serum Therapy.

SIR ALMROTH EDWARD WRIGHT, London, England, said that bacterial diseases are the most important of all diseases. But the therapeutic treatment of them has been most imperfect. One hundred years ago by bleeding, large doses of antimony, etc., an attempt was made to fight the causes. Next the expectant method was introduced. The results were better than before, and this method is still largely employed. By it nine out of ten typhoid fever patients may be saved. But it is not satisfactory, for instance, in infectious endocarditis or in Malta fever. Nor is it useful in those diseases where Nature makes no effort, for example in lupus, chronic bronchitis or the chronic discharge from the uterus or ear. Expectant treatment covers but a small realm of disease and does it poorly. Finally, the antiseptic treatment was introduced to be employed internally as well as externally. But it has largely failed. Septicemic diseases are not much affected by antiseptics, e. g., typhoid fever or tuberculosis. Even the skin is not usually much influenced by them, e. g., acne. The antiseptic kills only the germs with which it comes in contact and we can never assume that the germs are only in the spot treated. If introduced into the blood, the antiseptic paralyzes the white blood corpuscle and prevents its phagocytic action on bacteria.

Next, with the safeguards of antisepsis, the surgical treatment was advocated and the word was extirpate. This is the negation of all proper therapeutics. As a result, often the bacteria are thrown into the blood stream and conveyed as foci elsewhere, and a simple local disease becomes multiple or miliary. Exposure of diseased parts to light of various kinds has been advocated. The light does not kill the germs, but it does draw lymph to the part and, hence, help some cases, just as poultices will, or as will the passive congestion of Bier's stagnation apparatus. This last is valuable in smaller joints but fails with the knee or hip. Finally, the serum treatment has been tried, but as regards streptococci, it has been disappointing. Hence, the necessity to look elsewhere for a method of scientifically and satisfactorily treating bacterial diseases.

The body itself, by itself will often work a cure. Therefore, there must be in the blood beside the nutriment material, which it certainly does afford the bacteria, some antagonistic forces. These are (1) the white blood corpuscles, the phagocytes, and (2), in the plasma some bacteria-trophic substances, which act like antiseptics on the bacteria and prepare them for the digestion of the phagocytes. These are styled opsonins. A case cited was of a man with a staphylococcus infection showing boils-sycosis, etc., when white blood corpuscles were compared with those of workers in the laboratory and found to ingest only half as many of these bacteria as the normal

healthy individual. This "opsonic index" was, therefore, 0.5 and when it was raised to 2.0 by Dr. Wright's method of vaccine treatment, he was cured. The normal opsonic index varies but little in healthy individuals. After inoculation, at first it drops a little—negative phase; then comes a marked increase—positive phase; to be succeeded in turn by a gradual decline to nearly the same level as before. A large dose of vaccine makes a much larger negative phase and allows little, perhaps no positive phase; i. e., it does harm. A small dose gives no negative phase and only a slight positive phase. Hence, it is important to determine in each case what the proper dose of that vaccine is for that patient, in order to obtain a higher opsonic index. A single inoculation is not adequate. We must repeat the dose. By too frequent doses we get a cumulation of negative phases with no chance for the positive phase to develop, and finally death ensues. The body can not meet too great a stimulation by vaccine. Therefore, each case must be watched. Each inoculation is to be treated as a separate event, and the attempt made to so regulate the dose and the interval that there shall be, a cumulation of positive phases and a rise of the opsonic index, step by step, after each dose.

Patients with a localized bacterial disease have a low power of resistance, a low opsonic index, 0.6 to 0.8. Many of these cases may be benefited by gentle massage, which induces an autoinoculation followed by a negative and a positive phase just the same as after vaccination. But there is marked danger. The germs may be scattered, just as they sometimes are by a surgical operation, and the dose be so great. A very marked drop is noted then in the opsonic index. Too thorough physical examination of a phthisical patient by a teacher and his class may produce the same untoward result. It is useful, however, to enable one to determine whether a focus is dead or still aglow, e. g., in the spine. Here a determination of the opsonic index, before and after a slight amount of motion, would at once determine the proper course of treatment. It is often necessary to increase this protective power and keep it high for a long period.

If the opsonic index is high, 1.6 to 1.8, it is of no use to try to make it higher by vaccine, and autoinoculations must be guarded against. Generalized septicemia always means autoinoculations. Dr. Wright cited a case and incidentally noted his belief that large doses of citric acid, given at once when a thrombus is formed, will decrease the coagulability of the blood and cause the prompt absorption of the thrombus. A patient whose system is doing nothing to fight the bacteria can be stimulated by a vaccine to do something. Sometimes several tests must be made in a single day. Usually, once in ten days will be often enough. Tubercular cystitis is one of the most satisfactory conditions for this method of treatment. An empyema or an unresolved pneumonia will yield. A case of cervical adenitis should yield in three months, doses being given three times in a month, the dose being so adjusted as to give the minimum negative phase. Boils are nearly always cured by one or two inoculations. Acne is much more resistant and requires two or three months. Suppurative cystitis gives good results. Vaccine from colon bacilli is always wise after an operation for gallstones. Vaccine can always be made directly from the pus of an operation. Hence, we may avoid a long operation by preparing the patient before with a vaccine. The patient to be operated on for hair-lip may be treated with a vaccine of the mouth-streptococci and thus fortified against th later development of suppuration from that cause.

IDAHO STATE MEDICAL SOCIETY.

Fourteenth Annual Meeting, held at Lewiston, Oct. 4-5, 1906.

Under the presidency of DR. J. B. MORRIS, Lewiston.

Officers Elected.

The following officers were elected for the ensuing year: President, Dr. L. P. McCalla, Boise; vice-president, Dr. J. M. Alley, Lapwai; secretary-treasurer, Dr. E. E. Maxey, Boise; chairman committee of arrangements, Dr. J. L. Stewart, Boise; chairman committee on legislation, Dr. W. F. Howard, Pocatello.

Boise was selected as the next place of meeting.

Resolutions Adopted.

The following report, made by a special committee appointed to consider recommendations contained in the secretary's report, was adopted:

1. We recommend that the society at this meeting instruct its committee on legislation to work for the passage of a proper measure to regulate the sale of drugs and proprietary and "patent" remedies.

2. We recommend that this society express to Senator Heyburn, through its secretary, the appreciation of the profession of our state for his able and persevering efforts, together with his coworkers, in securing the passage of the national Pure Food Law.

3. In the matter of the division of funds when new district societies are organized, it is recommended that the following plan be adopted as an equitable plan for dividing the funds of the original district society: (1) let each district society, the new and the remainder of the old, be allowed the full amount of dues and membership fees collected for the year in which the new district society is organized, for their respective districts, and (2) that the remaining balance in the treasury of the original society be divided between, or among, the districts in the ratio of the paid membership in each district for the year preceding the organization of the new district.

4. It is recommended that the Idaho State Medical Society instruct its committee on legislation to act for the society, in conjunction with the State Board of Medical Examiners, in an endeavor to enforce the law regulating the practice of medicine in Idaho; and it is further recommended that the campaign of organization be continued, and that every effort be made by the committee on legislation and the members of this society in an endeavor to secure the passage of needed medical legislation at the next session of the legislature.

A. M. A. Medical Education Standard Approved.

DR. MAXEY, secretary, presented the following resolution, which was adopted by the society:

Resolved, That it is the sense of this society that it commend the recommendations of the Council on Medical Education of the American Medical Association concerning the preliminary education required of candidates for the degree of doctor of medicine; that it recommends the adoption of this high standard of preliminary education by the State Board of Medical Examiners of Idaho; and that it instruct the committee on legislation of the Idaho State Medical Society to endeavor to secure any necessary amendment to our medical laws as such standard of preliminary education may require.

Health Bill.

On motion, the following resolution was adopted:

Resolved, That the members of the Idaho State Medical Society are heartily in favor of a law providing for a state board of health and the registration of vital statistics, and hereby instruct their committee on legislation to use its influence at the coming session of the state legislature in an effort to secure the passage of a health bill similar to the one introduced at the last session of the legislature.

President's Address.

DR. J. B. MORRIS, Lewiston, emphasized the importance of a more thorough organization of the profession of the state, and suggested the formation of several new district societies as a means of getting the profession together. He urged the members to use their utmost endeavor toward securing the passage of more stringent medical laws and to aid in enforcing state and national pure-food laws. He thought it would not be best, at the present time, to try to amend our medical laws, as has been suggested, to provide for reciprocity of state licenses.

Insurance Examining Fees.

In the report of the secretary, Dr. E. E. Maxey, he advocated an agreement of the physicians of the state to keep the rates for examining applicants for insurance not less than $5.

Prevention of Venereal Diseases.

DR. J. M. TAYLOR, Boise, read a paper on this subject.

DISCUSSION.

DR. J. N. ALLEY, Lapwai, thought the physician is to blame for a great many innocent infections. Too many uncured patients are allowed to marry innocent girls. He favors a campaign of education of the public that will enlighten the people as to the prevalence of venereal diseases, the difficulty of cure, the danger of innocent infection, and the proper methods of prevention. He agreed with the essayist in that alcohol is a very material factor in the propagation of venereal diseases. High living is another causative factor.

DR. C. W. SHAFF, Lewiston, said that police surveillance has proved a failure, for the simple reason that examining physicians will not take necessary pains in their examinations of prostitutes. He makes it a rule in his practice not to dis-

charge his patients with gonorrhea until at least two weeks after the gonococcus has disappeared from the discharge. He lauded the influence of the Y. M. C. A. in keeping young men pure and clean, and thought that physicians should encourage young men to affiliate themselves with such institutions.

DR. R. L. GILLESPIE, Portland, found many cases of melancholia caused by gonorrhea. He thinks that physicians should be moralists and give freely of their advice to the boy and girl just entering into manhood and womanhood. The dark side and dangers of sexual dissipation should be explained to them, and he sees no reason why a young man should not be as virtuous as he expects his wife to be.

DR. C. E. SEARS, Wallace, thought that there should be some set rule for saying that a man is cured, and suggested that in cases where a discharge still lingers, that the prostate should be massaged, the urine centrifugated and examined for gonococci every week for three months, before the patient can be considered cured.

Neurasthenia and Melancholia.

DR. R. L. GILLESPIE, Portland, read a paper on neurasthenia, and DR. JOHN W. GIVENS, Oro Fino, one on melancholia. These two papers were discussed jointly.

DISCUSSION.

DR. W. T. WILLIAMSON, Portland, thought heredity an element that enters into the cause of nearly all cases of neurasthenia and melancholia. He considers neurasthenia purely a nervous disease inasmuch as it has so far been impossible to discover its cause or pathology. Melancholia is not a disease; it is only a symptom. We are advancing in our classification of the types of insanity. He did not agree with Dr. Givens on the subject of discussing the suicidal tendency with melancholic patients. He thinks it is a mistake to do so, because the patient's mind is more or less in a groove and any argument with or presentation of the subject to the patient is suggestive. Such patients are not capable of reasoning and arguments usually excite antagonism. He emphasized the beneficial effects of opium in the treatment of melancholia by driving away the patient's melancholic thoughts and thus obtunding the diseased mind. This, with full feeding and proper exercise, is the best line of treatment.

DR. R. L. GILLESPIE, Portland, said that he did not wish to be understood as claiming that neurasthenia is a disease in the same sense as locomotor ataxia. He believes it to be purely functional, but its pathology is not known. These patients are in a groove, and the more they think the deeper becomes the groove. Children's habits should be better regulated. Our school system is too rigid. Excesses of every kind should be avoided. Liquor, tobacco, late hours, etc., have no place in a child's life.

DR. J. W. GIVENS, Oro Fino, believes in discussing the subject of suicide with his melancholic subjects, as it will often strengthen the paient and enable him to resist the desire. He said he is not afraid to discuss the patient's condition with him, but, of course, one must know the patient's condition and use care. He is of the opinion that we can overfeed these patients, as all of the digestive organs are more or less depressed and in no shape to be overburdened. In his opinion, melancholia is caused by a perverted nutrition, and this gives the indications for treatment.

Neglected Conditions of Childhood.

DR. E. F. CONYNGHAM, Lewiston, read this paper.

DISCUSSION.

DR. R. C. COFFEY, Portland, stated that he has found that a large per cent. of the nurses who enter the hospital before 21 years of age contract flatfoot. But age is not the only factor as luxury previous to coming to hospital in large framed women seems also to be a predisposing cause. He thinks that all children should go barefooted.

DR. A. C. SMITH, Portland, said that flatfoot never develops in children who have gone barefooted, and he thinks that all children should go barefooted.

DR. J. N. ALLEY, Lapwai, spoke of placing strips of sole leather in the shoe to raise the arch of the foot. In his experience this has been very satisfactory.

DR. C. E. SEARS, Wallace, said that in the use of the different appliances recommended for this trouble we forget that weakness of certain muscles is the cause of the deformity found, and appliances do not cure this weakness. Severe cases must have weak muscles exercised.

Diarrhea in Infancy and Early Life.

DR. ALEX. HUNTER, Kendrick, contributed this paper.

DISCUSSION.

DR. C. W. SCHAFF, Lewiston, laid stress on the fact that we are yet unable to determine in many cases the causative factors in the diarrhea of infancy. He stated that in Lewiston they had very few cases during the hot summer months, but in the fall, with the onset of colder weather, there is a marked increase in the number of cases.

DR. R. W. COFFEY, Portland, thought that the quality of the drinking water is to blame for most of these cases of diarrhea. In Portland the leading undertakers state that since the city began using the Bull Run water, or pure water, the death rate from this disease has decreased about 20 per cent.

DR. C. E. SEARS, Wallace, stated that at Wallace they had two sources of water supply—wells and city water. The latter is piped for some distance from a mountain stream and is considered pure. In the families using the city water he has found very few cases of diarrhea in children, while in families using well water there is an epidemic of diarrhea every year.

DR. J. W. GIVENS, Oro Fino, said that in the treatment of these cases he found it advisable to follow the suggestions of Christopher concerning the diet. When the stool smells sour, cut out hydrocarbons and feed the child a nitrogenous diet, and when the stool smells foul and very offensive, cut out nitrogenous diet and feed on hydrocarbons, such as rice-water, barley-water, etc. Albumin-water is an excellent food in most cases. It is often a problem to know what to do for these little fellows. The season of the year is not altogether the cause of these conditions. Watermelons and fruits unquestionably have causative effect. In his treatment of diarrheal conditions he has secured excellent results from the free use of mineral water, boiled milk and black pepper.

Surgical Anatomy of the Mastoid Antrum.

DR. C. W. SHAFF, Lewiston, read this paper.

DISCUSSION.

DR. A. C. SMITH, Portland, has often found it very difficult to find the triangle spoken of as a guide in locating the antrum. He thought a better plan is to use the external meatus as a point of base. A horizontal line passing through the upper half of the external meatus, and extending posterior far enough (about one-fourth inch) to the free posterior wall of the canal, will represent the lower and anterior limits of the bone incision. He contended that it is better to take a chance of cutting into the sinus than to leave a portion of the diseased bone. The hemorrhage can be controlled by a firm packing of iodoform gauze. With the facial nerve it is different. If it is possible to avoid injury to this structure it must be saved, but even here, if it is necessary to sacrifice the nerve rather than to leave diseased bone, the nerve should be cut.

DR. R. C. COFFEY, Portland, agreed with Dr. Smith that there are cases in which we are compelled to disregard all rules as laid down for guidance in operating on these cases. The surgeon must have a clear head, must know his anatomy, and use his best judgment in treatment of each case.

Obstetrics in Country Practice.

DR. W. A. ROTHWELL, Kendrick, contributed this paper.

DISCUSSION.

DR. S. E. BRUCE, Lewiston, took exception to the use of the antepartum douche, claiming that it is not only useless but often injurious.

DR. E. L. BURKE, Culdesac, thought that the diagnosis of the presentation is important. It is not unusual to prolong the use of forceps because of the failure to diagnose the presentation as a difficult one.

Diagnosis and Treatment of Gastric Ulcer.

DR. CHAS. E. SEARS, Wallace, read this paper.

DISCUSSION.

DR. J. F. HURLBURT, Lewiston, said that this condition is often very confusing. The symptoms may not appear in their regular order, and not infrequently the first indication of an acute gastric ulcer is the hemorrhage. He is in doubt as to the indications for surgical interference.

DR. R. C. COFFEY, Portland, stated that the Mayos never operate on a gastric ulcer case until the patient has seen and tried the treatment of at least seven medical men. Ante mortem inspection has thrown much light on this condition. It is now known that the vast proportion of the chronic, incurable cases of dyspepsia are caused by chronic gastric ulcer. Rodman treats these cases for four weeks when, if there is no improvement, he considers them surgical.

DR. A. C. SMITH, Portland, believed that surgery is in a period of evolution. The objectionable features of gastroenterostomy are gradually being eliminated, but gastroenterostomy will continue to be done posteriorly, with short loop and elimination of the pylorus. He is of the opinion that the pyloroplasty of Finney will be the operation of the future for these cases. With this operation there are fewer adhesions and the pylorus is preserved.

Peritonitis and Intussusception.

DR. T. J. COSTELLO, Lewiston, read a paper on "Surgical Treatment of Peritonitis," and DR. R. C. COFFEY, Portland, one on "Intestinal Intussusception." These two papers were discussed jointly.

DISCUSSION.

DR. A. C. SMITH, Portland, said that the two main features of the treatment of peritonitis are posture and drainage. Elaborate work of any sort should be avoided at operation, and local anesthesia should be used in as many cases as possible. Females are often drained to advantage through the vagina. The mortality is high in gangrenous cases of intussusception on account of their acute intensity, and he believed it will always remain high. He thinks the radical operation will be done less in the future and that physicians will be more inclined to temporize. The ileo-cecal anastomosis with the Murphy button is very often a good operation, leaving the gangrenous portion to slough off. He prefers the lateral anastomosis as it is easier and more quickly done.

DR. C. E. SEARS, Wallace, said that early diagnosis gives the best means of saving these patients, and the earlier the operation is done the better the results. He thinks that the empty intestine and the prevalence of colic, in infants, are important etiologic factors in intestinal intussusception.

DR. R. I. NEWELL, Spokane, thought that there is some question as to the advisability of using rectal salines because of the fact that such injections tend to excite peristalsis and increase the amount of invagination.

DR. R. C. COFFEY, Portland, said that no one operation is applicable to all forms of intussusception, and that the operation done by him on this case should probably be limited to chronic cases. In regard to the treatment of peritonitis, besides drainage, he puts the patient in almost an erect sitting position, about 60 degrees, using a double inclined plane for back and leg rest. It is a radical modification of the Fowler position, and, he thought, should be called postural position.

Value of Blood Examination in Surgery.

DR. R. I. NEWELL, of Spokane, read this paper.

DISCUSSION.

DR. C. E. SEARS, Wallace, emphasized the point that the value of the white blood count in appendicitis and peritonitis is not in the single count, but in the results of a series of consecutive counts. He considers a single count as of practically no value whatever.

DR. R. C. COFFEY, Portland, said that our knowledge of the pathology of the blood is continually changing and enlarging. At present the tendency is to study the kinds of white blood cells found. An abnormal excess of the polymorphonuclear cells is considered of more diagnostic value than a hyperleucocytosis.

The Therapeutic Limit of Mechanical Therapy.

DR. SUSAN E. BRUCE, Lewiston, read this paper.

DISCUSSION.

DR. W. A. ROTHWELL thought that mechanical therapy, if used in connection with common sense and regularity of time for going to stool, is of great value in the treatment of constipation.

DR. R. L. GILLESPIE, Portland, said that massage undoubtedly has its place in therapy, but it can be overdone. The question of diagnosis is so important, however, that massage in ignorant hands is apt to do as much harm as good. Massage is acknowledge to be an excellent treatment for constipation, but it must not be carried too far, nor should other rational methods be excluded.

Therapeutics

[It is the aim of this department to aid the general practitioner by giving practical prescriptions and, in brief, methods of treatment for the diseases seen especially in every-day practice. Proper inquiries concerning general formulæ and outlines of treatment are answered in these columns.]

Varicella.

In cases of varicella, isolation should be practiced, according to the *Cyclopedia of Med. and Surgery.* The child should, as a rule, be put to bed for a day or so and sponged once or twice daily with a warm carbolized solution, carbolized lanolin being applied to the spots to allay the itching. Later, when the crusts have formed, the following combinations may be applied:

℞ Acidi carbolici ..... m. xv 1
Acidi borici ..... ℥iss 6
Glycerini ..... ℥iii 12
Aquæ rosæ ..... f℥i 30
Aquæ q. s. ad ..... f℥iv 120
M. Sig.: Apply to the affected parts once a day. Or:

℞ Acidi carbolici ..... m. v 30
Ichthyoli ..... ℥iss 6
Petrolati liq. q. s. ad ..... ℥i 30
M. Fiat unguentum. Sig.: Apply locally on a soft cloth. Or:

℞ Ichthyoli ..... gr. x 65
Ung. zinci oxidi ..... ℥i 30
M. Fiat unguentum. Sig.: Apply locally on a cloth.

Acute and Chronic Bronchitis.

As a combination in the treatment of acute bronchitis, Stevens recommends the following:

℞ Vini ipecacuanhæ ..... f℥iss 6
Potassii citratis ..... ℥iii 12
Tinct. opii camphoratæ
Syrupi acaciæ, āā ..... f℥i 30
Aquæ q. s. ad ..... f℥vi 180
M. Sig.: One tablespoonful every four hours in water.

When the condition tends to become subacute the following combination is advised:

℞ Terebeni
Olei eucalypti, āā ..... f℥ss 2
Strych. sulphatis ..... gr. 1/3 02
Codeinæ sulphatis ..... gr. ii-iii 12-.20
M. Fiant capsulæ No. xii. Sig.: One capsule every four hours.

In the chronic form the following combinations are of value:

℞ Terebeni
Olei eucalypti
Olei santali, āā ..... f℥i-iss 4-6
Codeinæ ..... gr. iii-vi .20-.25
M. Fiant capsulæ No. xxiv. Sig.: One capsule after each meal and at bedtime. Or:

℞ Terpini hydratis ..... ℥i 4
Guaiacol carb. ..... ℥ii 8
Strych. sulphatis ..... gr. ss .03
Codeinæ ..... gr. iii .20
M. Fiant capsulæ No. xxiv. Sig.: One or two capsules three or four times a day. Or:

℞ Apomorphinæ hydrochlor. .....gr. ss |03
Syrupi pruni Virg. .....f℥ii 60
Syrupi picis liquidæ .....f℥iv 120|

M. Sig.: One tablespoonful three times a day in water.

As an inhalation the following combination is of value, according to Stevens:

℞ Chloroformi .....f3ss-i 2-4|
Creosoti
Terebeni
Olei pini Sylves, āā f3iss 6
Alcoholis q. s. ad .....f℥i 30|

M. Sig.: From 5 to 20 drops to be used in the inhaler three or four times a day.

Leucorrhea.

This condition is caused by a hypersecertion of the vaginal glands or those of the cervical canal of the uterus. According to Hare, in his "Therapeutics," this condition is dependent on many causes for its existence, such as a catarrh of the Fallopian tubes, a general plethoric condition or a state of anemia from any cause.

The treatment of leucorrhea, according to Hare, may be directed toward internal medication, with the hope of remedying the condition or by local applications. Some authorities advise strongly against any local treatment, especially when leucorrhea exists with the pregnant state. They believe that frequent antiseptic douchings destroy the epithelia and render the mucous membrane less able to withstand bacterial invasion. To correct the anemia which is so frequently present in these cases, Hare advises the following combinations:

℞ Acidi arsenosi .....gr. ¼ |015
Ferri reducti .....gr. v |30
Quin. sulphatis .....gr. xxx 2|

M. Fiant pilula No. xx. Sig.: One pill three times a day.

Or:

℞ Tinct. ferri chloridi .....f3i 4|
Tinct. cinchonæ co .....f℥ii 60
Tinct. gentianæ co q. s. ad .....f℥iv 120|

M. Sig.: One dessertspoonful three times a day, after meals.

This author states that small doses of the sulphate of iron are better than too large doses, owing to its astringent properties; at the same time the bowels must be carefully watched.

The local applications should consist in counter irritation and vaginal injections, or painting the vaginal mucous membrane over with proper applications, such as a mixture of iodin, carbolic acid and chloral, as follows:

℞ Iodi resublim. .....3iv 15|
Acidi carbol. crys.
Chloralis hydratis, āā .....℥i 30|

M. Rub the iodin and chloral in a glass mortar into a powder and add the carbolic acid. Sig.: To be applied by the physician to the parts involved.

Astringent injections, according to Hare, are advisable. A very cheap astringent may be prepared by making an infusion of powdered white oak bark in a pint of water. The following combination may be used for the same purpose:

℞ Glycerini .....℥i 30|
Acidi tannici .....℥i 30|
Aquæ dest. .....Oiv 2000|

M. Sig.: To be used as a vaginal douche.

Or the following combination, according to Ringer, may be employed:

℞ Sodii bicarb. .....3i 4|
Tinct. belladonnæ .....f3ii 8|
Aquæ .....Oi 500|

M. Sig.: To be used as a vaginal wash.

When the leucorrheal discharge is fetid the following combination is advised:

℞ Potass. permanganatis .....3ss 2|
Aquæ .....Oi 500|

M. Sig.: As a douche.

In purulent vaginitis, specific or otherwise, the following is advised:

℞ Creolin .....f3ss-i 2-4|
Ext. hydrastis canaden. flu f3iiss 10
Aquæ .....f℥viii 240|

M. Sig.: Two tablespoonfuls to a pint of hot water; shake thoroughly and use as an injection.

He mentions the fact that when vaginal injections are used large quantities—from three to four liters—should be used at a time. The following astringent solution is a very good one:

℞ Zinci sulphatis
Alum sulph., āā .....3i 4|
Glycerini .....f℥vi 180|

M. Sig.: One tablespoonful to each quart of water, as an injection.

When cases of vaginitis come on acutely some authorities advise rest in bed with a mild purgative along with the vaginal douches, which should consist of a gallon of hot boric acid solution, one teaspoonful of the powder to each pint of water or a 1 to 5,000 bichlorid of mercury solution. After the acute symptoms have subsided and the trouble becomes more or less localized, the inflamed areas may be touched with a silver nitrate solution of from 5 to 10 per cent. strength.

Epilepsy.

The essential feature in the pathology of epilspsy, according to M. R. Hughes, in the *Kansas City Medical Record*, is the alternating state, irritation and paralysis of the vasomotor mechanism of the brain and allied nervous system, but chiefly the brain. It is a functional vasomotor disease and alternating vasomotor condition of transitory paralysis and irritation, the irritation causing the contraction of the arteriole supply of the convulsive area involved. There is also ventricular dilatation, according to this author, caused by the excess of cerebrospinal fluid producing the coma and its symptoms. He states that no epileptic brain where death came in the status has ever been found with undistended ventricles. Petit mal attacks consist in a lesser vasomotor paralysis and lesser arteriole contraction involving the same motor area.

In the treatment of the disease, W. Runge, in the *British Medical Journal*, states that the diet should be unirritating and that indigestion and overloading of the stomach must be avoided. It has been found, however, that neither a vegetarian nor meat diet affects the number of fits. Exercise in the open air, without overexertion, is recommended. Among the medicinal preparations mentioned, lithium carbonate is one advised in cases in which there is no unusual output of uric acid, and while the author mentions a great many recent preparations which have been experimented with in the treatment of this disease, he states that the bromids still remain prominent as a therapeutic agent of epilepsy. Potassium bromid is considered the most effective preparation, or when this can not be given, sodium bromid, ammonium bromid or lithium bromid are recommended. He mentions the fact that strontium bromid has been found of value by some authorities on the ground that the system is more tolerant of this preparation than of the potassium bromid while the effect is equally as great. The important point that he brings out in the treatment of epilepsy is that the administration of the bromid should be continued over a long period of time. There are many opponents, however, to this preparation in combating the epileptiform attacks, basing their skepticism either on the poor results obtained in some cases, or on the fear of bromism in other cases. Other authorities, however, state that this latter fear is overdrawn and that the careful administration of the bromids will as a rule prevent the appearance of bromism. The digestion, of course, must be kept in the best possible condition by giving the patient large quantities of milk along with mineral waters in order to increase the excretion of solids through the kidneys.

When the heart is affected, potassium bromid must be administered with care, and in some cases must be entirely avoided. If there is increased salivation the author recommends tannin and hyoscyamus; for acne some preparation of arsenic is advised in combination with the bromids. The idea is still maintained that the diet should be poor in sodium chlorid as a means of rendering the bromin more effective. This idea is based on the fact that the bromin in the system takes the place of chlorin, consequently a diet which contains but a little sodium chlorid will render the patient more sensitive to bromid.

Runge speaks of the disadvantage of this method of treatment in that the patient quickly tires of the diet without salt,

and to remedy this condition the idea of using sodium bromid in the bread instead of common salt was introduced by Balint. His diet was as follows: From one-half to one quart of milk, from one-half to one dram of butter, three eggs, from 300 to 400 grams of bread and fruit. This diet contains two grams of salt and three grams of the bromids. Gowers recommends the combination of bromin with belladonna, digitalis and iron, while Brech advises strychnin with the bromid. Bechterew, according to the author, recommended giving the bromids in combination with infusum adonis vernalis. In some of his cases codein was combined with the bromids and was found to be very effective when the bromids alone failed. D. R. Brower of Chicago has had wide experience with both of these combinations with very beneficial results.

In summing up his article, the author states that the epileptic should order his whole life with reference to his disease; a suitable diet and a peaceful life is of great importance as well as the nature of his occupation. In general traumatic epilepsy he advises a bromid treatment, especially if after the injury general convulsions with loss of consciousness come on. On the other hand, trephining is to be preferred if at first there is only partial epilepsy and if the convulsions begin in a particular group of muscles, or if there is a localizing aura, especially if this aura can be produced by pressure on a scar. Typical Jacksonian epilepsy, whether traumatic or not, should always be treated early by trephining. For this purpose he recommends Horsely's method of excising the cortex involved. The long course of the bromid treatment should always follow the operation.

According to Italian investigators, who have made a study of the influence of diet in epilepsy free from salt and reduced in salt, the salt-free diet notably diminishes in all epileptics the number and severity of the attacks. In some cases they were kept away for several months. While in the reduced salt diet the number of fits was only diminished. To reduce the number and violence of attacks it was generally necessary to give small doses of bromid along with this diet, especially in the severe forms of the disease. According to their experience, a salt-free diet alone or in combination with the bromids, even when kept up for some years, did not produce on the patient any disturbance of the general condition of either the body or the mind.

Medicolegal

Sufficient Evidence of Severe Injury to Testicle Without Immediate Pain—Inferences Seemingly Opposed to Natural Law.

The Kansas City Court of Appeals says, in the personal injury case of Dunphy vs. St. Joseph Stockyards Co., that when one of the company's switch engines was derailed the plaintiff was sitting sidewise on the front drawhead with one foot on the footboard to partially support his weight, and with the projecting head of an iron pin in front of his privates. He claimed that the concussion from the derailment produced the wounding of his scrotum by the hard substance on which he was sitting. Whereas the company insisted that, under the facts disclosed by the plaintiff, it was physically impossible for him to have sustained the injuries of which he complained in the manner claimed by him.

According to the plaintiff, he experienced no pain at the time in the parts affected, and did not know he had been hurt until perhaps an hour afterwards. He did immediately suffer from nausea of some severity, but made no complaint. When the engine was replaced on the track, he resumed work and worked through the day. His testicles begun to pain him about an hour after the injury, and the pain increased during the day. After he went home in the evening, he complained to his brother of his injury, and both examined the injured parts. Two blue marks were discovered on opposite sides of the surface of the bag, indicating that it had been severely pinched. The next day he reported for duty and worked after a fashion, but was greatly distressed by the pain, which was then quite severe and continued to increase. He attempted to work during the next two days, and then was compelled to cease on account of the injury. The day he quit work he consulted a physician, who directed him to go to bed and use hot flaxseed poultices. He remained under that physician's care about a month, and then employed another one, who treated him for several months, and then found it necessary to remove one of the testicles on account of its rotten condition.

The company insisted, and in this was supported by the expert testimony it introduced, that it was utterly impossible for the testicle to have received an injury from a blow or from sudden compression of such severity that degeneration would follow without the accompaniment of intense pain, and, since the plaintiff admitted he suffered no pain, the court was asked to declare that he received no injury to his testicles from the negligence charged. The company argued and attempted to prove that the plaintiff for a year or more preceding the occurrence in question had been afflicted with gonorrhea. The whole fabric was built on an admission made by him that about one year before his injury the physician of a relief association had examined him and told him that he had the disease. But the court says that this was purely hearsay and devoid of probative value. The plaintiff vigorously denied that he had the disease or any of its characteristic symptoms. The physician who first treated him gave him no treatment for it, and the second one stated that he found no evidence of its presence.

Therefore the court was confined, it says, to the consideration of a single question: Was the inferenee that the plaintiff's injury resulted from a blow or bruise received during the derailment so plainly opposed to natural law as to compel its rejection? It is well settled that courts will not stultify themselves by giving any heed to the testimony of witnesses or the inferences deducible therefrom that are so opposed to all natural law and reasonable probability as to be manifestly false. On the other hand, courts should observe the utmost caution to avoid assuming knowledge of natural facts and laws that are beyond the scope of common positive knowledge. The mysteries of nature are so manifold, deep, and subtle that the finite mind can not indulge in dogmatic conclusions respecting them without falling into error. Human nature, being microcosmic, is not certainly known save in its most prominent outlines. Different men in their physical characteristics differ as widely as they do in outward appearance. No two individuals are alike, and, when the court is called on to apply procrustean rules, it should see to it that they fit all alike. It has been said that one man's meat is another's poison. What will kill one man will hardly injure another, and what will cause excruciating pain to one is often quite painless to another. The second physician, a reputable and skilled one, reached the conclusion from his knowledge of the case and its history that the plaintiff's condition was the direct result of the injury of which he complained. His process of reasoning was rational and plausible. In his opinion, intense pain does usually accompany a violent injury to the testicles, but the presence of pain and its degree depend on the physical peculiarities of the subject, the nature of the injury, and the circumstances under which it is received. In his science, he knew of five causes that could have produced the degeneration, cancer, syphilis, gonorrhea, tuberculosis and external injury. His investigations disclosed no evidence indicating the presence of the first four mentioned. By exclusion but one cause was left that could have produced the condition before him, and this he accepted as the real cause. Although it seems extraordinary that the plaintiff should have escaped immediate pain, the court can not say that this fact made his injury in the manner charged a physical impossibility. There was no error in treating this issue as one of fact. A judgment for the plaintiff for $2,000 is affirmed.

Liability of Railroad Company to Surgeon Under Rules.

The St. Louis Court of Appeals says that the case of Hays vs. Wabash Railroad Company was brought to recover for professional services rendered by the plaintiff in the treatment

of a man injured while a passenger on one of the company's trains. At the time the plaintiff was the local surgeon of the company, and also local surgeon of a hospital association composed of and supported by the employés of the company. The conductor of the train on which the man referred to was injured telegraphed to the plaintiff, informing him of the injury and asking him to meet the train and take charge of the man, which he did, having him removed to the hospital of the employés' association, where he operated on him and continued to treat him until he was discharged from his employment by the company. He reported the case to the chief surgeon of the hospital association, but did not report it to the company's chief claim agent, although the uncontradicted evidence was that it was his duty to do so and he was furnished with blanks for the purpose. The chief claim agent testified that on receipt of such reports he determined whether or not the company would bear the expense of medical and surgical treatment for injured passengers, and that no local surgeon was authorized to treat an injured passenger at the expense of the company without the consent or direction of the proper claim agent. The company, the evidence also showed, paid the man's hospital bill.

One of the company's rules was: "In case of wrecks or accidents where a number of persons, either passengers or employes, are injured and require immediate attention, summon at once the nearest competent surgeon; summon at the same time whichever local surgeon can be gotten to the scene of the accident most quickly, and notify by wire at once the nearest hospital and the chief officers of the road, giving full particulars as to the names and whereabouts of the injured persons, the name of the surgeon in attendance and stating what further action is required for the relief of the injured." Another rule was: "The hospital, dispensary and local surgeons who have heretofore, or may hereafter be appointed by the chief surgeon of the hospital association to such positions in connection with the hospital association, are hereby appointed local surgeons of this company for the care and treatment, under the rules hereinbefore established, of all passengers, citizens and non-employés who may be injured by this company's lines, and they shall be summoned if possible in all such cases, and as such will be respected and assisted in the discharge of their professional duties, when called on."

The court holds that, in meeting the train at the depot, in response to the conductor's telegram, taking charge of the man and removing him to the hospital, and there treating him for such reasonable time as the company's claim agent could have been notified of the case and his answer returned, the plaintiff acted strictly within the terms of the first rule quoted above and as he did not agree to render gratuitous services for the company, wa clearly entitled to recover the reasonable value of his services rendered during such time. Again, referring to both rules, it says that it was plain that under these rules the plaintiff had authority in the first instance, to treat the man at the expense of the company, the question arising when, if at all (before the plaintiff's discharge as local surgeon), his authority ceased. The conclusion is that the plaintiff's recovery should be confined to services rendered in the circumstances stated above with reference to the application of the first rule.

The report to the chief surgeon of the hospital association, the court says, did not excuse the plaintiff's failure to report to the general claim agent, whose testimony was that he alone had authority, after receiving sueh report, to determine whether or not an injured passenger should be professionally treated by the company's surgeon. Nor does the court think that the effect of this rule or custom of the company was avoided by the fact that two assistants of the claim agent had visited the town to investigate the facts of the injury, one of them making a personal request of the plaintiff to cure the man, it further appearing that the agency of the one making the request did not include jurisdiction over personal injury cases, while there was no evidence that the other assistant claim agent said anything about treating the man, and while the general claim agent testified that he never heard of the case until he heard of it through the plaintiff's attorney.

But a rule of the company which stated that because it donated to the hospital association the use of its telegraph and train service to facilitate the care and treatment of sick or injured employés all persons in the company's service, and all others, were notified that no bills for medical or surgical services, etc., would be paid by the company, unless the same were first authorized by the general claim agent, the court holds was inapplicable to cases of injuries to passengers.

Current Medical Literature

AMERICAN.

Titles marked with an asterisk (*) are abstracted below.

Medical Record, New York.

October 20.

1 *Angina Pectoris; Its Mechanism and Treatment. F. Hare, London, England.
2 Diagnosis and Treatment of the Acute Infections of the Gall Bladder. L. W. Hotchkiss, New York.
3 *Illustrative Cases of Prostatic Carcinoma. J. B. Squier, New York.
4 *Koplik Spots; Their Relation and Interest to Laryngologists. H. G. Langworthy, Dubuque, Iowa.
5 The Medical Museum. D. B. Delavan, New York.
6 *Dried Tetanus Antitoxin as a Dressing for Wounds. J. J. Kinyoun, Glenolden, Pa.
7 *Case of Intestinal Obstruction in a Child, Due to Tuberculous Peritonitis Following Bronchopneumonia. H. H. Pelton, New York.
8 *Disinfection of Rooms by Formaldehyd. Comparative Bactericidal Value of Various Methods. H. A. Higley, Brooklyn, N. Y.
9 *Perforative Appendicitis Caused by a Foreign Body. F. H. Jackson, Houlton, Maine.

1. Angina Pectoris.—Hare states that the pain of angina pectoris depends on vascular distension in the mediastinum, which is the result of a more or less localized vasodilatation and of a more or less generalized peripheral vasoconstriction. Two other factors in the mediastinal distension which have to be considered are the work done by the left ventricle and the integrity of the mitral valve. Whatever reduces the work of the left ventricle will reduce the distension, and *vice versa*. The integrity of the mitral valve is essential for the development and maintenance of the mediastinal vascular distension. Inhalation of amyl nitrite is the most prompt and reliable means of relief in most cases. Iodid of potassium in large doses affords in many cases marked relief from the tendency to the recurring paroxysms.

3. Prostatic Carcinoma.—Squier emphasizes the futility of the endeavor to do more than palliate the patient's sufferings by operation when he is the victim of prostatic carcinoma. If the disease is at all advanced, the majority of patients live longer if palliative measures are employed than by extensive radical operation. Squier found that permanent suprapubic drainage gives great comfort to the patient.

4. Koplik Spots.—Langworthy has noticed that Koplik spots appear earliest on the mucous membrane near the angle of the mouth and in areas covered by the gums. A strong, clear light is essential.

6. Dried Tetanus Antitoxin as a Dressing for Wounds.—Kinyoun has applied antitoxin to abrasions, or incised, contused and lacerated wounds, and also a number of suppurating wounds with a view of preventing tetanus. These injuries healed more rapidly and with less disturbance than had been previously observed in those treated in the ordinary way. It has been demonstrated, he states, that the powdered serum was responsible for the good results. A number of infected wounds due principally to vaccination and furunculosis have been treated in like manner. In these cases healing rapidly resulted. The powdered tetanus antitoxin was also used once in a nasal operation. The wound healed within a week. These results showed that the dried serum possesses qualities other than its specific body, the antitoxin. This must be of the nature of an immune body.

7. Intestinal Obstruction Due to Tuberculous Peritonitis Following Bronchopneumonia.—Pelton describes the case of a child, less than a year old, that had an attack of broncho-

pneumonia in February. As the signs in the chest and elevated temperature did not entirely disappear, the possibility of tuberculous involvement of the bronchial glands and lungs was considered. The patient was removed to the hospital in the last part of March in a state of marked prostration. The abdomen was full, distended, tense and tympanitic, except in the flanks, where there was shifting dulness. There was general tenderness, more marked on the right side, and moderate general rigidity. Rectal examination was negative. Exploratory laparotomy revealed small miliary tubercles about the cecum where adhesions were most abundant. At the cecum a hard, movable mass in the lumen of the gut was felt. The mass was pushed on into the transverse colon, and the wound was closed. Death took place about two hours later. Autopsy was not permitted.

8. **Disinfection of Rooms by Formaldehyd.**—Higley declares that formaldehyd gas, when placed under proper conditions and in sufficient quantity, is a powerful bactericidal agent. This action, however, is limited to the surface of objects with which it comes in contact, its penetrating power being practically nil. He has investigated different forms of apparatus for producing and evolving formaldehyd gas. In the tables which he presents the best comparative bactericidal results were obtained with the lime method.

9. **Perforative Appendicitis.**—Jackson describes a case of perforative appendicitis which came under his care. A diagnosis of an exacerbation of a chronic appendicitis was made, and operation advised. When the peritoneum was opened a large amount of bloody serum poured out. The omentum was highly congested and was adherent to the cecum and completely enveloped the appendix. A pointed object was felt projecting through the omentum. It proved to be a fish bone an inch and a quarter long.

Boston Medical and Surgical Journal.

October 18.

10 *Small Fibroma of the Ileum Resulting in Obstruction of the Bowel, with a Consideration of Various Forms of Benign Intestinal Tumors. J. W. Dewis, Boston.
11 *The Bier Treatment of Infections and Septic Wounds of the Extremities. E. A. Codman, Boston.

10. **Obstruction of Ileum by Fibroma.**—Dewis reports the case of a woman aged 64, who for ten years suffered from obstinate and persistent constipation and occasional vomiting spells, without pain, and without relation to the ingestion of food. After partaking of a very hearty dinner she was attacked suddenly by severe abdominal pain and distress, vomiting of offensive material and symptoms of collapse. The abdomen was protruded, tympanitic and tender. Death ensued six days afterward, resulting from shock. On opening the abdomen there was found in the region of the ileocecal valve an intussusception about 2 inches long, with a round, movable body attached to the lower end. Growing from the wall into the lumen of the intestine, about 4 inches above the ileocecal valve, and lying over the edge of the invaginated portion was a small oval tumor, dark red brown in color, which was found to be a fibroma. Dewis believes that the acute obstruction was caused by the tumor. He reviews the literature on this subject and appends a long list of references.

11. **Bier Treatment of Infections of Extremities.**—Codman is very much impressed with the clinical value of the Bier treatment of infections and septic wounds of the extremities. The treatment is applied in the following manner: When an old (i. e., one who has been seen before) patient arrives in the morning his dressing is taken down and the wound examined and its condition recorded. A rubber strap two inches wide and provided with a buckle is applied about his arm or leg well above the lesion. This is drawn as tight as possible without stopping the pulse. The wound is covered with moist corrosive gauze and the patient sits down and waits an hour. The part is looked at from time to time to be sure that the circulation is not too greatly checked. At the end of the hour a moist dressing and splint are applied. The wound is not as a rule packed or drained. The same routine is followed each day. The cases which did the best were suppurations of the staphylococcus type, while the streptococcus or erysipeloid type has been less remarkably affected.

The New York Medical Journal.

October 20.

12 *The Salt-Free Treatment of Epilepsy, Apropos of Thirty-seven Cases. A. Gordon, Philadelphia.
13 *Eczema. A Sketch of the Process and Its Management. J. C. Johnston, New York.
14 *Radical Mastoid Operation Modified to Allow the Preservation of Normal Hearing. W. S. Bryant, New York.
15 Dwarfed and Deformed Mastoid a Sequel to Imperceptible Mastoiditis Complicating Chronic Suppurative Otitis Media. W. E. Driver, Norfolk, Va.
16 Improved United States Inspection of Animals, Meat and Meat Food Products. D. A. Hughes, Omaha, Neb.
17 La Médecine and Le Médecin in Molière. W. B. Konkle, Montoursville, Pa.
18 Postmortem Findings in Gastric Ulcer. M. R. Barker, Chicago.
19 *Gastrointestinal Disturbances Associated with Migraine. J. A. Lichty, Pittsburg, Pa.
20 Fatal Case of Scopolamin Poisoning. G. W. Ely, Pittsburg, Pa.

12.—See abstract in THE JOURNAL, Oct. 20, 1906, page 1323.

13. **Eczema.**—Johnston reviews the clinical history of this affection and presents particularly a very thorough study of its histopathology.

14. **Modified Radical Mastoid Operation.**—Bryant describes a modification of the radical mastoid operation in patients who had good hearing up to a short time before the operation. These, he says, are usually cases of acute extensive involvement of the temporal bone, more rarely cases of chronic purulent otitis media, in which the sound conducting mechanism has been retained more or less intact. The object in these cases is to remove all the diseased bone and to produce perfect drainage, while at the same time preserving the auditory function of the middle ear. The ligamentous attachment and mucous membrane reduplications of the ossicular system lie between the epitympanum and the atrium, and prevent through drainage, though they allow drainage from both their upper and lower surfaces. To establish this drainage Bryant makes a U-shaped myringotomy to drain the atrium, and opens the mastoid antrum to drain the epitympanum. It is also necessary to remove all the diseased bone to arrest the progress of the infection and open all the cells of the middle ear system to throw them into one cavity leading to the epitympanum. The outer anterior wall of the antrum should be wholly taken away, except enough to support the annulus with the adjacent membrana tympani. The suspensory ligament of the malleus must be protected from injury, also the fan-shaped ligament of the incus. By these procedures it is possible to drain the upper and back part of the tympanum through the mastoid wound, and the lower anterior part through the meatus without permanent injury to the sound conducting mechanism. A case in point is cited.

19. **Gastrointestinal Disturbances Associated with Migraine.**—Lichty adds 108 cases to 73 cases previously reported in which gastrointestinal disturbances were associated with migraine. He thinks that it is decidedly an hereditary disease. Of the 181 cases, 116 gave a definite hereditary history, and only a few gave no hereditary history at all. Of the whole number 155 were females and 26 males. Ninety had prolapse of one or more of the abdominal organs, most often the right kidney. One hundred and thirty-seven patients gave a definite history of digestive disturbances between the attacks, such as heaviness after eating, pyrosis, fermentation, constipation or diarrhea. One hundred and one gastric analyses were made. There were 32 cases of hyperacidity, 24 cases of hypoacidity, and 25 were normal. By regulating, or leveling up, as Lichty calls it, digestive disturbances, he succeeded in accomplishing fairly good results. Bromids and cannabis indica are the only two drugs he used.

Lancet-Clinic, Cincinnati.

October 20.

21 Relief of Pain in Labor. W. Gillespie, Cincinnati.

American Journal of Obstetrics, New York.

October.

22 *Careful Study of the Parametrium in Twenty-Seven Cases of Carcinoma Cervicis Uteri, and its Clinical Significance. J. A. Sampson, Albany, N. Y.
23 *Urethral Bacteria as a Factor in the Etiology of Cystitis in Women. F. J. Taussig, St. Louis.
24 *Evolution of Modern Cystoscopic Instruments and Methods. L. Peters, Columbia.
25 Cystocele. J. R. Goffe, New York.

26 The Operative Treatment of Cystocele in the Past One Hundred Years. C. G. Child, Jr., New York.
27 The Construction of a New Vagina. A. Brothers, New York.
28 A Fatal Case of Eclampsia, After the Delivery of Twins; Remarks on the Etiology and Pathology of the Disease. C. G. Parnall, Jackson, Mich.

22. **The Parametrium in Carcinoma Cervicis Uteri.**—Sampson was able to demonstrate cancer either in the parametrium, the pelvic lymph nodes or both, in 20 out of 27 specimens studied, and furthermore, the pelvic lymph nodes were not removed in 3 of the 7 cases in which the growth was apparently local, thus suggesting that it may not have been local in all of these 3 cases. In 3 of the 10 specimens in which cancer was not found in the parametrium, it was found in the pelvic lymph nodes, i. e., a small primary growth had metastasized to the pelvic lymph nodes without apparently infecting the parametrium through which it had passed. The parametrium was found involved in 17 instances; 8 times by direct extension alone, either *en masse*, or in the form of thread-like processes frequently along the lymph channels or in the nerve sheaths; 3 times by metastases in the lymph structures of the parametruim without any evidence of a direct extension of the disease beyond the cervix; and in 6 cases both forms of invasion were present. In the 9 instances of metastases in the parametrium, the lymph nodes were involved in all but one case, and in only one case was the metastasis apparently in a lymph channel.

Adhesions, from pelvic inflammatory disease, independent of the cancer, may make the cancer appear more advanced than it is, by causing pain which may wrongly be attributed to the cancer. The presence of a direct extension of the disease into the parametrium is usually accompanied by a reaction on the part of the surrounding tissue, which manifests itself by a cellular infiltration or hypertrophy of this tissue, thus causing induration in addition to that which may be caused by the cancer. The parametrium may feel indurated and yet show no evidence of the cancer in it. A parametrium may feel normal and yet contain cancer, occasionally as thread-like extension but probably more often as metastases. The pelvic lymph nodes are involved in from one-third to one-half of the operable cases, and only by the microscope can it be determined whether they are cancerous or not.

The primary growth may be limited to the cervix, and yet it may have metastasized to the pelvic lymph nodes, or the former may be large and the latter nodes free. A wide excision of the parametrium is demanded, first, because it is so frequently involved, 17 out of 27 cases; and secondly, because the growth is local in from one-half to two-thirds of the operable cases, and probably even in 40 per cent. of the extensive ones. Sampson believes that in probably half of the cases of cervical cancer seen at the present time there has been a history of neglected uterine bleeding for over six months; this was true in the 27 cases reported here. A short period of neglected uterine bleeding or other symptoms referable to uterine trouble, may permit the growth to extend so far that the disease becomes incurable.

23. **Urethral Bacteria in Cystitis in Women.**—Taussig states that the normal urethra free of disease is sterile in only a small proportion of cases. In his series of 45 cases it was sterile eight times. In about half of the total number of urethræ examined pathogenic germs were present. The percentage in his series was as high as 62.5 per cent. Of the pathogenic bacteria found, *Staphylococcus pyogenes albus* is the most common. The occurrence of the colon bacillus seems very variable. It is found frequently when patients are confined to bed. In his series it was isolated only three times. That these urethral bacteria are actually carried into the bladder by catheterization was shown in eight examinations in which the urethral secretion and the urine obtained by catheterization were compared. In 6 cases the bacterial findings were identical, and in the other 2 cases the difference was a slight one.

Irrigation of the urethra with boric acid removes a large proportion of the urethral bacteria, but when the number is great does not suffice to remove all. Taussig claims that the double catheters devised for the purpose of avoiding contamination with the urethral bacteria do not as yet deserve to be generally used. Tests made with the instrument of Rosenstein show that its protection is only a partial one. It has other objections, so that ordinarily the usual glass catheter is preferable. Whenever repeated catheterization becomes necessary, therefore, Taussig advises certain precautions to prevent an infection of the bladder by urethral bacteria. Hexamethylenamin or an allied product should be given internally. The ordinary glass catheter is introduced part way into the urethra and the urethra irrigated with half a pint of boric-acid solution, taking care that the fluid does not enter the bladder. The catheter is then passed into the bladder, the urine emptied, and the bladder irrigated with one to two pints more of boric-acid solution.

24. **Evolution of Cystoscopy.**—Peters believes that the cystoscope of the Nitze type is the best instrument for cystoscopy in the male, but that it is unnecessarily elaborate, delicate and expensive for examining the female bladder where the conditions are so much simpler than in the male. Kelly's instrument, he thinks, is the ideal one for the female bladder.

American Journal of Surgery, New York.
October.

29 Subcutaneous Rupture of Abdominal Viscera, with Especial Reference to the Intestine and Kidney. E. Eliot, Jr., New York.
30 Surgery of the Tympano-Mastoid Region of the Infant and Young Child. S. J. Kopetzky, New York.
31 Drainage of the Pelvic Cavity of the Male (in Peritonitis). W. Jepson, Sioux City, Iowa.
32 Fracture of the Base of the Fifth Metatarsal Bone by Indirect Violence. W. M. Brickner, New York.
33 *Roentgen Ray Treatment of Malignant Disease of the Bladder Through a Suprapubic Incision. A. L. Gray, Richmond, Va.
34 Rupture of Both Kidneys with Intraperitoneal Hemorrhage; Removal of All of Left Kidney and Part of Right Kidney. A. L. Franklin, Cumberland, Md.

33.—See abstract in THE JOURNAL, Sept. 15, 1906, page 889.

Physician and Surgeon, Detroit and Ann Arbor, Mich.
September.

35 Unsuspected Parasitic Origin of Many Dermatoses. W. F. Breakey, Ann Arbor.
36 Acute Pneumococcic Cerebrospinal Meningitis of Nasal Origin. H. A. Freund, Ann Arbor.
37 Lessons in Longevity. J. S. Caulkins, Thornville, Mich.
38 Metatarsalgia. W. E. Blodgett, Ann Arbor.

Chicago Medical Recorder.
October 15.

39 Some Forms of Hereditary Cataract. C. A. Wood, Chicago.
40 Nervous Children. A. Church, Chicago.
41 Treatment of Rectal Fistula. C. J. Drueck, Chicago.
42 Comparative Speed Efficacy of the Intravenous Method of Administering Mercury in Syphilis. W. F. Bernart, Chicago.
43 Physiologic and Toxicologic Effects of Alcohol. J. Madden, Portland, Oregon.
44 The Magnate's Heart. W. F. Waugh, Chicago.

Journal of the Kansas Medical Society, Lawrence.
October.

45 Difficulties of an Internist. J. H. Latta, Wichita.
46 Acute Epidemic Jaundice. H. H. Ross, Sterling.
47 Brain Tumor. W. S. Lindsay, Topeka.
48 Postgraduate Work in Europe. J. E. Hunt, Atchison.
49 Medical Treatment of Diseases of the Gall Bladder and Biliary Tracts. D. I. Maggard, Wichita.

Denver Medical Times.
October.

50 Management of the Diabetic. E. P. Hershey, Denver.
51 Diabetes. P. D. Rothwell, Denver.
52 Treatment of Diabetes Mellitus. F. A. Greedy, Denver.
53 Case of Diabetes Mellitus. G. B. Crews, Denver.
54 Surgical Treatment of Tuberculosis of the Upper Air Passages and the Ear. R. Levy, Denver.
55 Intestinal Tumor. N. A. Johnson, Denver.
56 Treatment of Puerperal Sepsis. G. Law, Greeley.

Utah Medical Journal.
October.

57 Methods and Principles of Diagnosis in Stomach Diseases. W. R. Tyndale, Salt Lake City.
58 Perforating Gastric Ulcer. F. L. Dixon, Denver.

Journal of the Association of Military Surgeons of the United States, Carlisle, Pa.
October.

59 Effects of Climatic Extremes on the Health of Battleship Personnel. C. J. Decker, U. S. N.
60 The Medical Officer and the Line—A Reminiscence. R. S. Woodson, U. S. A.
61 Penetrating Gunshot Wound of the Abdomen, with Nineteen Perforations, Operation with Recovery. J. H. Iden, U. S. N.

Interstate Medical Journal, St. Louis, Mo.

October.

62 Importance to the Surgeon of a Study of Anatomic Appearances in the Living. M. H. Richardson, Boston.
63 Pyuria. E. G. Mark, Kansas City, Mo.

Indiana Medical Journal, Indianapolis.

October.

64 Arthritis Deformans and Chronic Articular Rheumatism; Their Treatment. G. D. Kahlo, French Lick Springs, Ind.
65 Phenomena of Life.
66 Influence of the Blood Glands on the Process of Metabolism. A. Lorand, Carlsbad.
67 Priapism from Nasal Reflex; Something for the Rhinologists. A. G. Hobbs, Atlanta, Ga.

The Medical Fortnightly, St. Louis.

October 10.

68 Internal and External Urethrotomy Combined. R. Harrison, London.
69 Talks to Recent Graduates. A. L. Benedict, Buffalo.
70 Ideal Attitude of the Physician Toward Alcohol as a Medicine, as a Food and as a Beverage. W. E. Shaw, Cincinnati.

Louisville Monthly Journal of Medicine and Surgery.

October.

71 Address of President Before Kentucky State Medical Association. G. S. McDonald, Beattyville.
72 Therapeutic Notes. W. T. Marrs, Peoria Heights, Ill.
73 Two Experiences with Acetozone. G. P. Brady, Chicago.
74 Uses of Atropin. A. P. Banfield, Catlettsburg.
75 Report of Cases. H. H. Grant, Louisville.
76 Fractures of the Upper Portion of the Femur. A. D. Willmoth, Louisville.
77 Uncle Josh on Modern Surgery. U. V. Williams, Frankfort, Ky.

Cleveland Medical and Surgical Reporter.

October.

78 Opium—A Practical Study. P. W. Shedd, New York.
79 Affections of the Seminal Vesicles. J. H. McVay, Toledo.
80 The Tonsil as a Factor in Infectious Diseases. C. H. Rust, Cleveland.
81 Ptomain Poisoning. P. H. Barton, Cleveland.
82 Congenital Abnormalities. J. T. Schlesselmann, Good Thunder, Minn.
83 A Plea for a Broader View of Homeopathy. C. S. Mack, Laporte, Ind.
84 Optical Defects of the Normal Eye. A. E. Ibershoff, Cleveland.

The Post-Graduate, New York.

October.

85 A Rapid Cure of Epithelioma of Lip. C. S. Cole, New York.
86 Report of a Method of Treating Pulmonary Tuberculosis. R. H. Halsey, New York.
87 Russell Treatment of Consumption Applied to Tuberculous Bones and Joints. A. H. Cilley, New York.
88 Malaria; Its Nature and Origin. H. T. Brooks.
89 Needed Reforms in the Medical Laws of the State of New York. F. Van Fleet, New York.
90 Myiasis. D. W. Cairns, New York.

Medicine, Detroit, Mich.

October.

91 Suggestions in Special Lines of Research Work for Women. V. A. Latham, Chicago.
92 Treatment of Iritis and Serous Iritis by Acetozone. C. Wray, London.
93 Enuresis. W. F. Stucky, Louisville, Ky.
94 Nargol in Acute Gonorrheal Prostatitis with Involvement of the Vesical Neck. C. L. Wheeler, Lexington.

Northwest Medicine, Seattle, Wash.

October.

95 Issues Which Confront the Medical Profession of the State of Washington. G. W. Libby, Spokane, Wash.

Journal of the Minnesota State Medical Association and the Northwestern Lancet, Minneapolis.

October 15.

96 Epidemiology as Applied to Typhoid Fever in Minnesota. H. W. Hill, Minneapolis.
97 Criminal Abortion. J. W. Andrewes, Mankato.
98 Objectionable Influence of Proprietary Medicines on the Young Practitioner. W. S. Fullerton, St. Paul.
99 Podagra. H. L. Staples, Minneapolis.

FOREIGN.

Titles marked with an asterisk (*) are abstracted below. Clinical lectures, single case reports and trials of new drugs and artificial foods are omitted unless of exceptional general interest.

British Medical Journal.

October 6.

1 *Medical Women and Public Health Questions. Professor Byers.
2 Place of Dermatology in the Medical Curriculum. N. Walker.
3 *Influence of Light-Hunger in the Production of Psoriasis. J. N. Hyde.
4 *Evidence of the Existence of an Autotoxic Factor in the Production of Bullous Disease. J. C. Johnston.
5 Demonstration by Lantern Slides. J. A. Fordyce.
6 *Errors in the Treatment of Cutaneous Cancer. A. R. Robinson.
7 *Evolution of Intraprimary Lesions of Syphilis. R. W. Taylor.
8 *Case of Pityriasis Rubra. T. C. Gilchrist.
9 Case of Dermatitis Vegetans. W. T. Corlett.
10 Wrong and Right Use of Milk in Certain Diseases of the Skin. L. D. Bulkley.
11 *Observations on the Etiology and Treatment of Eczema. G. Chambers.
12 The Blood in Relation to Skin Diseases. T. Houston and J. C. Rankin.
13 International Coöperation in the Inspection of Emigrants and Immigrants. P. H. Bryce.
14 State Control of Health. J. C. Drennan.
15 *Legislation Regarding Food Preservatives. A. McGill.
16 *National Supervision and Standardization of Food. H. L. E. Johnson.

1. Medical Women and Public-Health Question.—Byers points out a few of the many public-health questions in which medical women may find ample scope for work, such as the medical inspection and supervision of school children; the reduction of infant mortality; the establishment of infant milk depots.

3. Light-Hunger in Production of Psoriasis.—Hyde emphasizes conclusions previously set forth that psoriasis is an expression in the skin of the human body of its resentment against long-continued exclusion of light from the surface. Psoriasis, he says, never affects the lower animals for the reason that the integument of such animals is very rarely screened from the light by artificial covering. If, he continues, psoriasis in man be an expression of resentment on the part of the skin against the partial or total exclusion of light from its artificially covered surfaces, it is clear that the number of persons whose skin is thus abnormally sensitive is relatively small. If psoriasis be a result of light-hunger in the skin of certain abnormally sensitive subjects, because of the greater or less degree of exclusion of light resulting from artificial covering of the body, the disorder should be most prevalent and most severe at those seasons of the year and in those countries in which sunlight is least abundant. The localization of the disease in the integument should be largely determined in the regions of such exclusion. The effective treatment would be by illumination of the regions chiefly involved.

4. Autotoxic Factor in Bullous Disease.—In view of the clinical evidence of systemic poisoning, which is known to be non-bacterial, the occurrence of eosinophilia and indicanuria, and the improved results of elimination treatment, Johnston thinks it hard to escape the conclusion that bullous disease is an autointoxication, and, further, that that autointoxication has its origin in the failure of the proteid metabolism. It is safe to assume, he says, that in the course of the process there is elaborated, possibly among many other toxic bodies, one with an action on vessel walls as specific as that of snake venom or the nettle. It operates, probably, everywhere in the body as well as in the papillary layer of the skin. The ultimate conclusion is inevitable that the skin lesions are local expressions of a general disturbance, and that the bullous group is only a striking variation from the general run of the poisonings which have their origin in perversion of the body processes.

6. Treatment of Cutaneous Cancer.—Robinson believes that it is impossible to lay down any special treatment of universal application in cases of cutaneous cancer. The treatment in each case should be determined by the individual characteristics presented by the growth, the nature, extent, depth and site of the lesion. With regard to general constitutional treatment he has found so far no evidence of any satisfactory result from internal medication, though he considers that very possibly a future opening up great possibilities lies in this direction, particularly by influencing the general economy by the secretions of ductless glands. He is convinced, however, that the imbibition of alcohol by the subjects of cutaneous cancer seriously hinders the good effects of treatment. The treatment, of whatever kind, should be directed to complete and thorough removal of the growth and with the least possible deformity. The mode of removal depends entirely on the character and site of the lesion—for example, flat growths should not be excised, but caustics and Roentgen rays employed. The Roentgen rays, in his opinion, however, have

been far too widely employed, almost justifying their designation as race suicide machines; they should be restricted to certain specific forms, and their use preceded by agents capable of lowering the vulnerability of the parts.

7. **Interprimary Lesions of Syphilis.**—Careful study has convinced Taylor that the syphilitic infective process is from the start a very rapid one, and that the disease is systemic from the date of its inception. The poison strikes directly for the blood vessels, and, causing there its peculiar changes, runs along them with astonishing rapidity and diffuses itself systematically throughout the body. The occurrence of successive chancres and of interprimary precocious syphilides, therefore, does not show that the parts invaded are the seat of an immunity due to their not yet being syphilitically infected, but, on the contrary, that these parts are from the onset actively syphilitic, and that the tissues react moderately well to the repeated early specific infection either as a result of experimentation or in clinical practice. Traumatism undoubtedly is largely the cause of all these lesions. The following conclusions were drawn:

1. By the autoinoculation of the secretion of the hard chancre in the primary period of a proliferative lesion resembling a secondary papule rather than a true chancre is produced.
2. In many cases a syphilitic is infected several times following a first infection, and a succession of primary lesions is produced.
3. In some cases infection of one or more portions of the body, usually extragenital, is produced by a second syphilitic individual or doner a short time after the development of the initial lesion.
4. Infection of a patient by a second syphilitic a short time after his or her virgin or primary infection occurs in exceptional instances.
5. Successive syphilitic lesions run a regular course, and do not usually portend malignancy.
6. The view that syphilitic infection is for a time local, and that there is an immunity to further early specific neoplasms in contiguous parts, is based on a false conception of the course of syphilitic infection. The poison of syphilis acts promptly, early, and progressively, and is a potential factor until its culmination is achieved in the developed systemic secondary stage.
7. The claimed immunization in primary syphilis is a chimera and founded on false pathology.
8. Though in general syphilis pursues a tolerably orderly course and its general exanthematic manifestations appear at the classical secondary climax, sparse precocious exanthemata may not infrequently be observed.

8. **Pityriasis Rubra.**—Gilchrist reports a case of this kind occurring in a woman aged 36, which was followed by gangrene of the left foot and the distal half of the right hand. The gangrenous process was noted from the very beginning and could not be prevented or stopped in its course. The affected parts were amputated.

11. **Treatment of Eczema.**—Chambers has obtained very gratifying results from the use of normal saline solution in the treatment of acute eczema. In making the application cheese cloth—8 to 10 thickness—is moistened with the solution and applied to the patches. To prevent drying the moist dressing is covered with oiled silk. The dressing should be changed twice a day. In cases in which the eczema is impetiginous he adds boric acid in sufficient quantity to the normal saline solution to make about 1 in 60. At each change of dressing it is well to wash the affected parts with the solution. As soon as the skin, by its color, smoothness, absence of crusts, etc., shows diminished inflammation and improved keratinization Chambers discontinues the dressing and applies a soothing ointment, such as Lassar's paste. Subsequently a mildly stimulating ointment may be required.

15. **Legislation Regarding Food Preservatives.**—McGill is in favor of specific permission in the legalization of food preservatives, that is, the law must name the substances which can be used, or it must be specifically prohibitive. The quantity that can be used also should be stated.

16. **National Supervision and Standardization of Food.**—Speaking of the recent legislation in the United States providing for pure food and meat inspection, Johnson says that from the politico-industrial point of view this legislation is excellent so far as it goes. From a medico-hygienic standpoint, however, it is not entirely efficient or satisfactory, as it tends to conserve the financial interests of the producer and to jeopardize the health of the consumer, by delaying the operation of the food bill, and by omitting the date of slaughter, production and inspection from the government certificate or label, thereby placing an immense quantity of meat and meat products, prepared under presumably careless and objectionable methods, now in cold storage or warehouse, on an equality with, and indistinguishable from, recent products prepared under careful government supervision.

The Lancet, London.

October 6.

17 *Scientific Investigation of the Psychical Faculties or Processes in the Higher Animals. I. P. Pawlow.
18 The General Medical Council; Its Powers and Its Work. D. MacAlister.
19 The Theory and Practice of Medical Education. N. H. Alcock.
20 *Injection of Antitoxin in Diphtheria by the Intravenous Method. A. O. Bisson.
21 Purin-Free Diets. W. A. Potts.

17. **Psychical Faculties in Higher Animals.**—The point considered in this lecture by Pawlow are psychologic definitions, reflex stimulation of the salivary glands, conditioned and unconditioned reflex action, methods of eliciting conditioned reflex action, various modifications and combinations of conditioned stimuli.

20. **Intravenous Injection of Diphtheria Antitoxin.**—Bisson records 200 cases of diphtheria treated by the intravenous injections. There were 90 mild pharyngeal cases and all of the patients recovered. Out of these 67 had the whole of the antitoxin intravenously, the others had it partly subcutaneously and partly intravenously. The total dosage given varied between 2,000 and 20,000 units. There were 30 severe pharyngeal cases, with 3 deaths due to paralysis. The total doses of antitoxin varied between 20,000 and 70,000 units. In 13 cases the antitoxin was all given intravenously (one of these patients died), in the others partly in that way and partly subcutaneously. Of 31 very severe pharyngeal cases 16 resulted fatally, death being due to cardiac paralysis. The total doses of antitoxin were between 20,000 and 110,000 units. In 4 cases all the serum was injected intravenously, and 2 resulted fatally. In 3 mild laryngeal cases the patients recovered, the antitoxin (8,000 units) being given intravenously. Ten severe laryngeal cases, in 2 of which the antitoxin was given entirely intravenously, recovered. Intubation was performed in all these cases. There were 5 very severe laryngeal cases, with one death from bronchopneumonia. One had all the serum intravenously. Three out of 4 mild pharyngolaryngeal cases had all the serum intravenously. All the patients recovered. In only 2 out of 8 severe cases of this type was the serum given intravenously. There were 2 deaths in this group. From October, 1904, to April, 1906, altogether 660 cases of diphtheria were treated in the Plaistow Hospital, with 92 deaths. Comparing this death rate with that of the cases treated by the intravenous method, it is 13.94 per cent. in the former and 16.5 per cent. in the latter. This, Bisson says, is partly due to the fact that all the very severe cases were chosen for the intravenous treatment. Out of the 200 cases there were 9 tracheotomies, with 3 deaths—a mortality of 33 per cent.—and there were 18 intubations, with 2 deaths—a mortality of 10.10 per cent.

Indian Medical Gazette, Calcutta.

September.

22 Cataract in the Capsule. H. Smith.
23 Some Observations on the Breeding Ground of the Common House Fly and a Description of a Species of Moth Fly. G. D. Franklin.
24 An Account of Plague in Bengal. (To be continued.) W. W. Clemesha.
25 Extraction of Cataract in the Capsule Versus the Ordinary or Capsule-Laceration Method. H. Gidney.

The Clinical Journal, London.

September 26.

26 *Group of Cases Illustrating the Surgery of the Biliary Apparatus. A. E. Barker.
27 Pyloric Obstruction in Infants. A. Garrod.
28 Radiotherapy in Skin Disease. J. Belot.

October 6.

29 Forms of Surgical Tuberculosis in Children. R. Johnson.
30 Tracheotomy. J. Berry.
31 Anemia in Children. H. Thursfield.

26. **Surgery of Biliary Apparatus.**—Barker reports the following cases: 1. Gallstone impacted in the common duct; cholecystectomy; common duct explored from duodenum; stone removed; recovery. 2. Cholelithiasis; cholecystectomy; recovery. 3. Suppurative cholelithaisis; *B. coli communis;* ab-

scess of the liver under gall bladder and reaching to portal fissure; abscess opened and stitched to abdominal wall; gall bladder opened separately, mucopus evacuated, and several stones drained separately; death occurred a month later. 4. Suppurative cholecystitis and gallstones; cholecystostomy; drainage; recovery. 5. Cholelithiasis; cholecystitis; cholecystectomy without opening gall bladder; recovery. 6. Carcinoma; nodule involving the common duct; extreme jaundice and suffering; cholecystenterostomy; complete relief. 7. Cholelithiasis with many adhesions; cholecystectomy; recovery. 8. Suppurative cholelithiasis; cholecystectomy after slitting up common duct; recovery. 9. Symptoms resembling severe biliary colic; exploration; hard mass in second part of duodenum with surrounding adhesions; duodenal ulcer; gastroenterostomy; recovery. 10. Symptoms obscure, rather pointing to cholelithiasis; hard lump and adhesions in second part of duodenum; probably chronic ulcer; gastroenterostomy; recovery. 11. Large stone in common duct; removed by choledochotomy; gall bladder excised; subphrenic abscess opened between ninth and tenth ribs; recovery. 12. Gangrenous cholelithiasis; large stone impacted in cystic duct; stone removed; gall bladder drained; recovery. 13. Suppurative cholelithiasis; large stone in cystic duct; removed; gall bladder stitched up; wound drained; recovery. 14. Cholelithiasis; cholangitis; cholecystectomy and drainage of common duct; death. 15. Cholelithiasis; cholecystectomy after freeing adhesions; recovery. 16. Cholelithiasis and cholangitis; cholecystectomy and opening of the common duct, which was drained with a rubber tube; recovery.

The Australasian Medical Gazette, Sydney.

August 20.

32 Epidemiology of Plague. J. A. Thompson.
33 Aneurism of the Ascending Aorta, with Slow Extravasation of Blood into the Pericardial Sac. J. C. Verco.
34 The Leucocytosis of Hydatid Disease. D. A. Welsh and J. E. V. Barling.
35 Administration of Morphin in Cases of Abdominal Section. C. S. Hawkes.
36 Case of Rupture of the Uterus. H. Carr.
37 Case of Bilharzia Hematobia. H. S. Stacy.
38 Case of Cerebrospinal Meningitis. G. Cuscaden.
39 Five Cases of Ankylostomiasis. F. Hamilton-Kenny.

Intercolonial Medical Journal of Australasia, Melbourne.

August 20.

40 Local Anesthesia. J. Ramsay.
41 Cocain Anesthesia by Schleich's Method. W. Moore.
42 Spinal Analgesia as a Special Form of Anesthesia. B. T. Zwar.
43 Case of Cerebellar Hemorrhage. A. V. M. Anderson.
44 *Access to the Knee Joint by Anterior Longitudinal Incision, with Section of the Patella. R. H. Russell.
45 Arrest of Respiration After Operation on the Skull. W. A. Wood and R. R. Stawell.

44. Exposure of Knee-Joint by Longitudinal Incision.—The operation described by Russell is said to be free from the drawbacks attending transverse section of the patella, and gives incomparably better access to the interior recesses of the joint. It is performed as follows, the knee being moderately flexed: 1. Make an incision starting two inches above the upper edge of the patella, carried downward to the tubercle of the tibia, passing over the middle of the patella and ligamentum patellæ. 2. Saw through the patella in the line of the incision opening the joint; incise the anterior joint structures upward to the upper limit of the suprapatellar pouch, and downward, splitting the ligamentum patellæ throughout to the tubercle of the tibia. 3. Fully flex the knee, and with blunt hooks applied to the two halves of the patella, pull them apart until they slide over the condyles of the femur. A few snips with scissors will release the synovial attachments at the lower part of the joint. It will now be found that the two halves of the patella will naturally tend to evert, so that they will lie on the sides of the limb, each with its articular surface outward; in fact, the whole of the anterior and lateral joint surfaces will be turned inside out. The operation having been completed, the limb is straightened, and the two halves of the patella return naturally to their normal position in the joint. There need be no wiring of the patella. The operation is finished by suturing the capsule of the joint from the patella upward; while from the patella downward, one or two sutures immediately below the bone are all that is required. Russell performed this operation on two occasions; both were for the performance of arthrodesis. The result in both cases was perfect.

Semaine Médicale, Paris.

46 (XXVI, No. 37.) *Le rôle des matières minérales dans l'organisme. A. Charrin.
47 (No. 38.) *L'autoinfection puerpérale au point de vue bactériologique. R. De Bovis.
48 (No. 39.) *Leucémie et radiothérapie. C. Aubertin.
49 Le calcul des probabilités appliqué au pronostic. M. Landolfi.

46. The Part Played by Mineral Substances in the Physiology of the Organism.—Charrin reviews the recently acquired knowledge in regard to the importance of the rôle of mineral substances in physiology, anatomy, chemistry and pathology, showing how the cell is liable to be influenced by them from innumerable points of view. At present the gaps in our technic leave many of their attributes still a problem, but even with the study of osmosis alone we have learned the secrets of a number of the organic mechanisms.

47. Puerperal Autoinfection from the Bacteriologic Standpoint.—De Bovis devotes several pages to a critical review of the contradictory literature on this subject. He remarks that it is evident that the obstetrician ought to sterilize the field just like the surgeon, but asks: Can he do it? He doubts if this is possible, even in the best regulated clinics. If the field were sterilized at the commencement of labor it would be impossible to keep it sterile during the long hours of labor with the woman moving about. Theoretically the vulva should be aseptic, but this can not be accomplished absolutely in practice. After childbirth the normal defensive action of the vagina is temporarily lost, to a greater or less degree, and germs may spontaneously work their way upward. The uterus may be sterile during the first day or so after delivery, but all investigators agree that by the fourth day from 33 to 85 per cent. of the women have pathogenic germs in the uterus, and their researches did not include anaërobic tests, which would probably bring the percentage still higher. The germs were found most numerous in the febrile cases, but they were encountered even more often in the non-febrile ones. De Bovis concludes that the possibility of puerperal autoinfection seems to be established beyond question, but that the obstetrician has it in his power to reduce materially the number of microbes. He adds that the microbes do not proliferate unless they find a pre-existing infection of the genital tract or relics of inflammation or structural conditions favoring the mechanical retention of morbid products. On the other hand, it is extremely doubtful, he continues, whether infection can develop in an absolutely healthy and well-formed woman without the intervention of some foreign factor. Puerperal autoinfection is thus seen to obey the same laws as general pathology—the presence of infectious germs on the one hand and a predisposed organ on the other. With insufficiently sterilized external genitals, the obstetrician may infect the woman with his finger or instrument, or rather inoculate her. In introducing into the vagina or uterus microbian species from without—which are the most virulent—he doubles the dose, both quantitatively and qualitatively. The patient who might have been able to conquer her own microbes succumbs in the struggle against the imported ones.

48. Roentgen Treatment of Leukemia.—Aubertin's conclusions in regard to Roentgen treatment of leukemia are that it is liable to prove a very effectual symptomatic measure against the disease, but more than this must not be expected from it. The patient should be kept under supervision, and as soon as the blood picture even approximates normal he would suspend the exposures. He would resume them again whenever the blood picture shows that further symptomatic treatment is needed. The exposures, he thinks, should be at considerable intervals, and be regularly and uniformly distributed over the entire blood-forming apparatus, lengthening the intervals as the blood picture shows signs of improvement, and never pushing the treatment to the stage of reduction of the colorless corpuscles below normal numbers. It is a purely symptomatic treatment, but of such possible efficacy that every leukemic patient should be given the benefit of it. The acute form of the disease is the least tractable.

Berliner klinische Wochenschrift.

50 (XLIII, No. 34.) Ueber Syphilome innerer Organe Neonatorum und ihre Beziehungen zur Spirochæte pallida. V. Babes and Th. Mironescu (Bucharest).
51 Ueber Metastasen Bildung bei transplantierten Sarkomen der Maus (of the mouse). M. Haaland (Christiania).
52 Fälle von Enteroptose und Cardioptose mit Rückkehr zur Norm (with return to normal). M. Einhorn (New York).
53 Zur Bewertung des Antistreptokokken-Serums für die Behandlung des Puerperalfiebers auf Grund statistischer Untersuchungen. Busalla (Hannover).
54 Changes in Organs Under Influence of Suprarenal Extract.—Weitere Untersuchungen ueber die von den Nebennieren-Extrakten bewirkten Veränderungen der Blutgefässe und anderer Organe. L. d'Amato (Naples).
55 (No. 35.) Geburtsstörung nach Ventrifixation des Uterus (interference with childbirth). Hocheisen.
56 Miliartuberkulose und Skorbut. Géronne.
57 *Action of Quinin on Hemoglobin and Test for Carbon Oxid in the Blood.—Ueber die Wirkung des Chinins auf den Blutfarbstoff nebst Mitteilung einer einfachen Methode zum Nachweis von Kohlenoxyd im Blut. S. v. Horoszkiewicz and H. Marx.
58 Ueber die kombinierte Resorcin- und Röntgen-Behandlung des Lupus vulgaris nach Ehrmann. S. Reines.
59 Zur Statistik und Pathogenese des Quinquaudschen Zeichens (crepitation of joint surfaces). E. Lauschner. (Concluded.)
60 Die modernen Grundlagen der Balneologie. L. Mohr.
61 (No. 36.) Experimental Absorption of Dead Tubercle Bacilli.—Resorption toter Tuberkel-Bacillen. A. Marmorek.
62 Examination of Blood in Nervous Affections.—Blutuntersuchungen an Nervenkranken. R. Bing.
63 Erkrankung der Caruncula sublingualis. E. Davidsohn.
64 Zur Serumbehandlung des Heufiebers (of hay fever). W. Weichardt.
65 Flour in Infant Feeding.—Mehlkinder. A. Keller.
66 Are Modern Methods of Diagnosing Syphilis Scientifically Accurate?—Genügt die moderne Diagnose syphilitischer Erkrankung wissenschaftlichen Forderungen? O. Rosenbach.

57. **Quinin Test of Blood Spots.**—Marx has recently published an announcement that quinin alters hemoglobin in a peculiar manner. Blood submitted to the action of a 15 per cent. solution of quinin for a few days changes color and the spectroscope shows, instead of the original oxyhemoglobin lines, a characteristic spectrum between the Fraunhofer C and D lines, corresponding to a wave length of from 596 to 628. These facts are important from a medicolegal point of view, as blood spots on linen, dating from 1901, placed in a hot, 15 per cent. solution of quinin, gave the characteristic quinin-blood spectrum distinctly. By heating a mixture of blood and a 10 per cent. solution of quinin, in the proportion of 2 to 4, the red blood changes rapidly to brown and the spectrum becomes visible at once. A characteristic reaction is also obtained with blood impregnated with carbonic oxid. The blood is mixed with an 8 per cent. solution of quinin hydrochlorate in the proportion of 2 c.c. blood to 4 c.c. of the quinin solution. The mixture is then heated slowly and evenly over a Bunsen burner until it boils up once. After cooling enough to handle the test-tube, two or three drops of freshly prepared ammonium sulphate are added, and the whole is briskly shaken at once. If the blood contains carbonic oxid, it turns a brilliant carmine red, while normal blood becomes a dirty greenish brown. These tints are durable for weeks.

Centralblatt f. Chirurgie, Leipsic.

Last indexed, page 1233.

67 (XXXIII, No. 34.) *Median Incision for Opening the Esophagus.—Mediane Schnittführung zur Eröffnung der Speiseröhre. H. Hans.
68 (No. 35.) *Silver-Rubber-Silk Instead of Silver Wire for Buried Sutures.—Silberkautschukseide an Stelle des Silberdrahtes zur versenkten Naht. O. Witzel. Id. Its Production. Wederhake (Bonn).
69 Ueber retrograde Darm-Inkarceration. E. Haim. Also in No. 39.
70 (No. 36.) Pharyngotomia suprahyoidea. L. Grünwald.
71 *Die nachträgliche Entfernung eingewachsener oder eingeklemmter Gazestreifen (removal of gauze that has grown in or is otherwise held). C. Lauenstein.
72 (No. 37.) Dorsale Fixation des Armes bei Schlüsselbeinbruch (in case of fracture of the clavicle). C. Bayer.
73 Oiled Silk to Protect the Intestine in Tamponing the Peritoneum.—Protektivsilk als Deckmittel für den Darm bei peritonealer Tamponade. Id.
74 Erhaltung des Weichteilnasengerüstes bei Oberkiefer-Resektion (retention of support for soft parts of nose in resection of upper jaw). C. Israel.
75 (No. 38.) *Zur Technik der Trepanation. M. Borchardt.
76 (No. 39.) *Zwei Modifikationen der Matrazennaht (mattress suture). A. Hofmann.

67. **Median Incision for Esophagus.**—Hans removed a deep impacted coin from the esophagus of a small child by a median incision below the trachea, over a Wildunger bougie filled with lead, introduced through the mouth. He considers a median incision for a foreign body low down superior to the usual technic.

68. **Silver-Rubber-Silk Instead of Silver Wire for Buried Sutures.**—Wederhake describes the manner of preparing a suture material for buried sutures, which Witzel has been extensively using with constantly increasing satisfaction. It does not absorb watery fluids, is very strong, and is absolutely sterilized in the making, while the technic of its production is simple and inexpensive. Every physician can make his own supply. The foundation is silk, which is wound on thick Kocher drains or glass plates, and the fat removed by soaking for 12 hours each in ether and then in absolute alcohol. The silk is then placed in a 10 per cent. solution of peroxid of hydrogen for 20 minutes. It is then removed to a silver solution made by adding drops of normal caustic soda solution to 30 c.c. of a 1 per cent. aqueous solution of nitrate of silver until the blackish brown sediment that forms is not increased by the addition of more drops of the soda solution. Usually about 10 drops of the soda solution are required. To the blackish brownish fluid resulting, water of ammonia is added, drop by drop, constantly shaking, until the precipitate produced by the silver nitrate is completely dissolved, and the fluid becomes clear and transparent. The silk is left in this silver solution for one hour. By the end of this time the silk has become so impregnated with pure molecular silver that it turns a deep black, with a silvery sheen. It must be examined to see that this impregnation proceeds evenly. Transverse sections of the silk should appear black with no white specks. The silver-silk is then dried in the incubator at 100 C., and then transferred to pure chloroform for two hours. After this the silk is placed in a chloroform solution of rubber for 12 hours. The rubber solution is made by dissolving 8 gm. black rubber (such as can be obtained from a dental depot) in 50 c.c. of chloroform. The silk is then rinsed in chloroform, dried, and then boiled for 10 minutes in a 1 per 1,000 solution of corrosive sublimate, in which it is set aside to keep ready for use. The same technic is applicable also to thread, hemp, etc. A simple silver-silk, without the rubber, is made by placing the silk in a 10 per cent. solution of peroxid of hydrogen for one hour, and then transferring to the silver solution for one or two hours, according to the size of the silk thread. After this it is boiled for 10 minutes in 1 per 1,000 solution of corrosive sublimate, in which it is kept ready for use. Witzel regards this silver-rubber silk as the solution of a pressing problem, the suture material thus prepared having all the good qualities of silver wire and of silk, with none of their drawbacks.

71. **Removal of Adherent Strips of Gauze.**—Lauenstein takes hold of the end of the strip of gauze with forceps and, instead of pulling it out, twists it continually on its axis. His experience has been that this loosens up small regions of adhesions at a time, and the final removal of the gauze is then an easy matter, even after a Mikulicz tamponade.

75. **Technic of Trephining.**—Borchardt gives illustrations of some instruments he has devised which he thinks are an improvement over those in ordinary use.

76. **Modifications of Mattress Suture.**—Hofmann illustrates his technic. The first view shows the usual mattress suture. The thread is then brought back and under the loop on the other side, and the ends are then tied. This materially reduces the traction on the edges of the wound. The two loops of the mattress suture thus form an X instead of lying straight and parallel as usual. The other modification is that the stitches, instead of passing below the edges of the wound, are brought out again just before the edges are reached, and pass above them. This also relieves the traction on the parts.

Centralblatt f. Gynäkologie, Leipsic.

Last indexed, page 1333.

77 (XXX, No. 34.) *Nervous Affections in the Puerperium.—Zur Kasuistik der nervösen Erkrankungen im Wochenbett. H. Sutter.
78 Perniziöse Anämie im Puerperium, kompliziert mit septischer Infektion. H. Meyer-Rügg.
79 (No. 35.) *Catalytic Action of Colloid Silver and Permanganate to Enhance Action of Peroxid of Hydrogen.—Ueber Spülungen mit Wasserstoffsuperoxid unter Einwirkung von Argentum colloidale oder von Permanganat. H. Füth (Zweifel's clinic, Leipsic).
80 (No. 37.) Eklampsie ohne Krämpfe (without convulsions). G. Binder.

81 Simplification of Technic of Obstetric Measurements.—Zur "Vereinfachung" meiner Mess-Methode der Conjugata obstetrica. L. v. Bylicki.
82 (No. 38.) Zur Indikation und Technik der Hebotomie. L. Seeligmann.
83 Zur Atonie des nicht schwangeren Uterus (of non-pregnant uterus). J. Meyer.

77. Nervous Affections in Puerperium.—Sutter describes a case of psychoneurosis befalling a young woman in the second week after childbirth. It was the only case of unmistakable hysteria discovered among 300 gynecologic and obstetric patients whose nervous condition had been specially investigated at his clinic. In this case the birth was illegitimate and the woman was facing court proceedings when she suddenly developed total paralysis, with attacks almost epileptiform in character, but all passing away in the course of two months.

79. To Enhance the Action of Peroxid of Hydrogen by Catalysis.—Füth calls attention to the way in which colloidal silver hastens the decomposition of peroxid of hydrogen without being altered itself. The combined action of the two is extraordinarily efficient in cleansing and disinfecting. A putrid endometritis rinsed with even a weak concentration of the two loses its fetid odor immediately. The colloidal silver acts as a catalyzer. He injected the two substances independently, through separate catheters, in such a way that they blended as they emerged. As colloidal silver is comparatively expensive, he experimented with other drugs and found that all the peroxids have a promoting effect on the decomposition of each other. Potassium permanganate and peroxid of hydrogen have a chemical reciprocal action on each other, and both yield oxygen. The addition of a little acid causes still more energetic decomposition on the part of the permanganate, and results in the production of a colorless salt of the acid used. He commends this combination as a remarkably effectual exaggeration of the familiar action of peroxid of hydrogen, magnifying its action immeasurably and accelerating it. The most practical form in which to apply the combination is to make two solutions. No. 1 is made by adding 35 c.c. of 3 per cent. H_2O_2 to a liter of water; No. 2 by adding 2 gm. of potassium permanganate and 5 c.c. of diluted (30 per cent.) acetic acid to one liter water. Decomposition commences as soon as the two solutions come together. In the combination $5H_2O_2$ plus $2KMnO_4$ makes $5O_2$; 1 gm. H_2O_2 gives thus 0.94 gm. O, about 700 c.c. O_2. When equal amounts of the two solutions are blending properly the escaping fluid is colorless, while if one or the other of the solutions preponderates, the outflow will be colored. Consequently, the receptacles holding the two solutions must be at the same height and each be connected with a catheter that allows two currents—an ordinary two-way catheter, such as is used for rinsing the bladder—will be found convenient for treating inoperable uterine cancer.

Zeitschrift f. klinische Medizin, Berlin.

Last indexed, page 756.

84 (LIX, Nos. 2-4, Bäumler Festschrift.) *Orthoperkussion, Orthodiagraphie und relative Herzdämpfung (heart dulness). G. Treupel and W. Engels.
85 *Ueber das Verhalten der weiblichen Geschlechtsorgane bei Hysterie, Herzfehlern und Chlorose (female sexual organs). P. Diepgen and M. Schröder.
86 *Beiträge zur Pathogenese der paroxysmalen Tachykardie. H. Reinhold.
87 *Zur Kasuistik der Rückenmarks-Tumoren (of spinal cord). Schüle.
88 Ueber einen Fall von Typhus-abdominalis mit hyperpyretischen Temperaturen. K. Mollweide.
89 *Heart Block.—Zur Kenntnis des Herzblocks beim Menschen (Adams-Stokesscher Symptomenkomplex). E. Roos.
90 Physiologic Importance of Rhodan Compounds.—Weitere Untersuchungen ueber die Bedeutung der Rhodan-Verbindungen im Tierkörper. A. Edinger and P. Clemens.
91 Metabolism in Case of Exophthalmic Goiter.—Zum Stoffwechsel bei Morbus Basedowii. P. Clemens.
92 Ueber 2 Fälle von Pentosurie nebst Untersuchungen ueber ihr Verhalten bei verschiedenen Ernährungsformen. F. Blum.
93 Ueber das Auftreten des Babinskischen Reflexes nach Skopolamin-Injektionen. R. Link.
94 *Zur Diagnose von Knochenmarkstumoren aus dem Blutbefunde (blood findings with tumors of bone marrow). K. Schleip.
95 Klinische Untersuchungen der Viskosität des menschlichen Blutes (human blood). Determann.
96 Ueber die Giftwirkung einiger Stämme von Aspergillus fumigatus und Penicillium glaucum nebst einigen Bemerkungen ueber Pellagra (toxic action). M. Otto.
97 *Body Weight and Milk Diet in Scarlet Fever.—Körpergewichte und Milchdiät bei scharlachkranken Säuglingen. H. Risel.
98 Studien ueber Urobilinurie und Ikterus. Ein Beitrag zur normalen und pathologischen Physiologie der Leber (liver). W. Hildebrandt.
99 Das Verhalten der Leukozyten bei Röteln. Id.
100 Ein Fall von nicht parasitärer Chylurie mit Sektionsbefund. F. Port.
101 Ueber die Bedeutung des Bacterium coli für menschliche Pathologie, mit besonderer Berücksichtigung der Infektion der Harnwege und der septischen Erkrankungen. G. Liebermeister.

84. Orthopercussion and the Relative Heart Dullness.—Treupel and Engels affirm anew that orthopercussion surpasses all other known methods of determining the outlines of the heart by percussion, and gives important information when all other means fail. They add a number of tracings of the findings in various cases, with discussions of several technical points. The orthopercussion findings were traced first and then the findings with orthodiagraphy.

85. Menstruation in Case of Hysteria, Chlorosis and Heart Affections.—Diepgen and Schroeder examined 75 hysterics, 116 women with heart affections, and 141 with chlorosis, in respect to menstruation. They found that the menses commenced unusually late in women who developed hysteria or chlorosis afterward. Menstruation was also inclined to be tardy and weak, an indication of defective physical development, to which was also due the predisposition to hysteria or chlorosis later. Hysteria seems to be a frequent cause for dysmenorrhea, but gynecologic affections accompanying hysteria seem to be merely an inciting cause, like the trauma in traumatic hysteria. In heart disease the general enfeeblement of the organism is responsible, as a rule, for the anomalies in menstruation observed. The findings all confirm the assumption that chlorosis is the result of a defective physical development.

86. Paroxysmal Tachycardia.—In the first of the 2 cases described, the tachycardia was due to a syphilitic basilar meningitis; in the second to a tumor in the left half of the brain. The findings in the heart were entirely negative in each case. Reinhold reviews the recent literature on the relations between paroxysmal tachycardia and affections of the nervous system.

87. Tumor of Spinal Cord.—Schüle's patient was a lad of 14 who presented symptoms diagnosed at first as sciatica. Pains and weakness in the legs appeared later, accompanied by abnormal desires to urinate. The kneejerk and tendon reflex could not be elicited, but the cremasteric reflex was pronounced. Nothing abnormal could be discovered in the spine. A sarcoma was diagnosed, in the vicinity of the twelfth dorsal vertebra, and it was removed. The benefit was only transient, as the malignant growth soon recurred.

89. Study of Heart Block.—Roos describes in detail a case of the Adams-Stokes' symptom-complex observed in a man of 72. It was a typical example of what Charcot called permanent slow pulse with syncopal, apoplectiform and epileptiform attacks. The syndrome becomes much more comprehensible when underlying heart block is assumed. Some affection of the bundle of His causes the trouble, while the rest of the heart is behaving normally. This assumption is rendered still more plausible by the fact that the trouble is observed in arteriosclerotics and in men oftener than in women. But even in the young and in persons not affected with arteriosclerosis, the bundle of His might become injured from some cause, possibly a myocarditic or syphilitic lesion. Stengel found in one case a patch of sclerosis in the septum when the rest of the myocardium was apparently sound. Heart block must be included among the severer affections of the heart, although patients may long survive. (See editorial in The Journal, Sept. 8, 1906, page 779).

94. Diagnosis of Tumors in Bone Marrow from the Blood Findings.—The blood findings in the 3 cases described differed in several respects from the findings known in any other affection. In each case there was metastasis in the bone marrow of a latent sarcoma or carcinoma in the stomach or intestines. The cancerous degeneration of the bone marrow was revealed by the presence of abnormal cell forms different from those observed in leukemia and severe anemia. Owing to the tendency of sarcomatous tumors to involve the blood vessels, the finding of tumor cells in the peripheral blood is not surprising. The problem will be to stain these cells in such a

way as to differentiate them from the manifold types of physiologic marrow cells or lymphocytes. These abnormal cells formed nearly 9 per cent. of the leucocytes in the first case in which the cancerous degeneration of the bone marrow had caused very slight symptoms during life, and the primary tumor in the stomach had remained entirely latent. Neuralgia had been observed at various points, but there was no tenderness of these points on pressure or tapping. In the second case there were no abnormal cells, but typical myelocytes were numerous as also the preliminary forms of neutrophile leucocytes and the red corpuscles showed great differences in size and outline, testifying to severe injury of the bone marrow. The latent primary focus was a carcinoma in the appendix, but points in the sternum and sacrum were painful when tapped, and the diagnosis of malignant metastasis in the bones was confirmed by autopsy. The characteristic changes in the blood findings in these cases confirm the importance of the blood for the diagnosis of malignant disease even in an early stage. In the third case these abnormal cells formed 14 per cent. of the total leucocytes and the red corpuscles showed great differences in size and shape. The abnormal cells were from two to four times as large as a red corpuscle, the enlargement being due principally to the size of the nucleus. The smaller ones had a round or notched nucleus, somewhat poor in chromatin, with a reticular loose structure. In some the chromatin was irregularly arranged so that parts seemed quite light. The nucleus was surrounded with a narrow, sometimes barely visible protoplasm, with faintly basic staining properties. The nucleus showed very little resisting power, and looked like a soft mass spreading out between the neighboring erythrocytes in several directions, without any perceptible lesion in the nucleus envelope. The larger forms had more protoplasm, and the nucleus was lobulated or shaped like an S, or was divided into two or three nuclei. The protoplasm did not show any granulation.

Zeitschrift f. Krebsforschung, Berlin.

Last indexed, page 468.

102 (IV, No. 2.) Transplantables Rund-Zellen-Sarkom des Hundes (of the dog). A Sticker.
103 *Zur Statistik und Kasuistik metastatischer Tumoren, bes. der Carcinom-Metastasen im Zentral-Nerven-System. K. Krasting.
104 Malakoplakie der Harnblase (of bladder). K. Hart.
105 Die mikroskopische Struktur der Magen- und Darm-Carcinome und ihr Verhältnis zum makroskopischen Bau. C. U. Ariëns Kappers and P. H. van Rooijen.
106 Die idioplastische Verbildung der Krebszelle und ihre Ursache, mit bes. Berücksichtigung des proteolytischen Enzyms (transformation of cancer cells). J. Rülf.
107 Die Schüllerschen Körperchen als die angeblichen Erreger der malignen Geschwülste (Schüller's bodies in cancers). H. Deetjen.

103. **Cancer Metastasis in the Central Nervous System.**—Krasting's article is based on 12,730 autopsies at Basle, from 1871 to 1905. Malignant tumors were found in 1,238 cadavers, that is, in 9.72 per cent. of the total material. Only 160 were sarcomata, the others were all carcinomata. The number of cases of carcinoma has increased regularly each year, from 1, 3, 19 and 10, in the first four years, to 48, 58, 65 and 57 in the last four years. Sarcoma has kept at about the same annual average of from 2 to 6. The findings as to location, age, etc., are tabulated separately. The majority of carcinomata occurred between the ages of 40 and 70, but sarcoma was observed about equally at all ages. Tumors in the brain were found in 144 cadavers, primary in 63.19 per cent. Of the 53 metastatic tumors in the brain it was a sarcoma in 14 and a carcinoma in 39. Primary carcinoma was not found in the brain in any instance, but secondary carcinomatous tumors in the brain were observed in about 18 per cent. of all cases. The melanotic sarcoma is the most malignant in respect to sarcomatous metastasis in the brain; the comparatively youthful are the most affected, and males more than females. Metastasis in the brain was observed in 4.77 per cent. of the carcinoma cases, and males predominated here also. Metastasis in the brain was observed most frequently with malignant chorioepithelioma, and next, in turn, with carcinoma of the suprarenals, pharynx, jaw, prostate, breast, bronchus, lungs, thyroid, sigmoid flexure, gall bladder, rectum, uterus, and, lastly, the stomach. The metastasis was multiple in only about a third of the cases. With the solitary tumors, the left side of the brain was affected twice as often as the right. The cerebrum was generally the seat of the metastasis, next in frequency the dura mater, the cerebellum and, lastly, the spinal cord. The cortex is most frequently affected, and the left central convolutions more than other parts. About 120 articles are reviewed from the literature for comparison.

Riforma Medica, Naples.

Last indexed, page 902.

108 (XXII, No. 32.) *New Pigment in Urine.—Un nuovo pigmento urinario. E. U. Fittipaldi.
109 *Tuberculosis of Glands Simulating Neoplasms.—Il morbo di Hodgkin e la tubercolosi a forma neoplastica delle ghiandole linfatiche. O. Cignozzi.
110 (No. 33.) *Cancer Precipitins.—Cancroprecipitine e loro applicazione alla diagnosi precoce del carcinoma gastrico. D. Maragliano.
111 Ricerche cliniche sulla separazione endovesicale delle urine dei due reni. D. Taddei. (Commenced in No. 32.)
112 2 osservazioni di encefalite emorragica. G. Valdonio.
113 (No. 34.) Protective Action of Liver in Regard to Cholera Toxin.—Intorno all' azione protettiva del fegato verso la tossina colerica. G. Padoa.
114 Come bisogna interpretare il fenomeno della spirochete pallida Hofmanni nella sifilide? R. Campana.
115 Sulla formazione di anticorpi in seguito all'ingestione di glutine vegetale (antibodies formed after ingestion of vegetable gluten). G. Castronuovo.
116 *Lead in Ice Cream and Ices.—Sulla presenza del piombo nei gelati. A. Baldoni.
117 (No. 35.) Submucous Lipoma of Colon.—Lipoma sottomucoso della flexura coli dextra. S. d'Este.
118 *Anemie gravi e setticemia da micrococco tetrageno albo. A. Brugnola.
119 *Curability of Tuberculous Meningitis.—Osservazione sulla guarigione nella men. tub. V. E. Ovazza.

108. **New Pigment in Urine.**—Fittipaldi has isolated a chromogen from the urine, after removal of the biliary pigments, which he thinks has never been described before. It was found only in icteric urine, never in the bile or liver tissue, and he suggests that it may have some importance for diagnosis and prognosis in case of icterus from cancer or cirrhosis. The simple technic of its isolation is described.

109. **Tuberculosis of Glands Simulating Neoplasms.**—Cignozzi's study of this subject is based on a case observed and on analysis of the literature. The findings establish the fact that the tubercle bacillus is able to induce in the lymphatic system lesions and symptoms similar in every respect to those of true pseudoleukemia, including hyperplastic multiple enlargement and suppuration of glands, enlargement of spleen and liver, fever, epistaxis and emaciation. The complete absence of caseous degeneration in the glands suggests lymphosarcoma or other neoplasm. The histologic lesions are atypical in nearly every respect; hyaline degeneration is frequent, and numerous congested vessels are prominent, the lumen permeable. The best means of diagnosing the condition is by extirpation of one of the glands. In his patient the enlarged glands in the neck and inguinal region nearly all suppurated, after which the patient improved. The findings in the sputa were always negative but at last accounts, although the general health had improved, one apex seemed slightly affected.

110. **Cancer Precipitins.**—Dario Maragliano has been experimenting with cancer juice obtained directly from the stomach of persons with cancer of the stomach, and injected into animals. The animals thus treated developed a serum which had a precipitating action on gastric juice from persons affected with cancer of the stomach, while no precipitation occurred with normal gastric juice. He found, however, that the cancerous gastric juice which he had injected contained four albuminoids: *a*, that common to the entire organism, contained in the blood; *b*, that common to all ulcerating sores; *c*, that peculiar to the stomach itself, and, finally, *d*, that peculiar to the cancer. In the precipitation test the first three kinds of albuminoids have to be got out of the way first before the true cancer albuminoid can give the specific reaction. The possible polyvalency of precipitating immune serums is a fact long since established. He injected from 3 to 10 c.c. of gastric juice obtained from the fasting stomach of patients with unquestionable gastric cancer, using rabbits and goats for the immune animals. Sometimes the gastric juice was so toxic that 1 c.c. was enough to kill a rabbit if not sufficiently diluted. After the fourth or fifth subcutaneous injection the precipitating reaction was usually evident at room

temperature between the second and sixth minutes. Earlier or later than this shows that the immunization is too intense or not intense enough. The fractional precipitation is the most difficult part of the task. There have to be three solutions prepared: *a*, normal human serum diluted 1 to 30 with physiologic salt solution; *b*, a solution of the secretion of a human ulceration diluted until it gives a distinct reaction with acetic acid plus potassium ferrocyanid, and *c*, the rinsing fluid from a stomach affected with gastritis, containing albuminoids independent of those ingested in the food. This fluid must have a neutral reaction, and cause turbidity when treated with acetic acid plus potassium ferrocyanid. These three solutions are mixed, forming a limpid fluid with a neutral reaction, and it is added to the immune serum in the proportion of one part fluid to two parts serum. It is shaken up repeatedly and set aside for from 24 to 48 hours. The resulting biochemical reaction passes through the stages of turbidity, formation of flakes and final precipitation of a sediment. The supernatant, limpid serum has thus been freed of the precipitins specific for the albuminoids of the blood, of the ulceration and of the special secretions of the morbid stomach. The residual serum contains only precipitins specific for the albuminoids of gastric cancer, and this is now being used in the clinic for diagnostic purposes, and also in a tentative way in therapeutics. He does not mix this serum with the cancer juice, but pours the latter on top, diluting it to a lesser specific gravity than the serum, and makes his diagnosis from the whitish ring that forms at the zone of contact in from two to five hours, according to the activity of the serum.

116. **Lead in Ice Cream.**—Baldoni has been examining the vessels, etc., used in making ice cream and ices at Rome, and shows that there is danger of lead poisoning from the frequent use of lead in the vessels and implements. He found from 1.7 to 2.5 mg. in portions of ices weighing from 652 to 710 gm. each.

118. **Serious Anemia from Micrococcus Tetragenus Albus.**—Brugnola reports 2 cases and cites 2 others published by Baccarani and Arullani in which classic parasitic anemia was induced by the presence of the *Micrococcus tetragenus albus*. In his 2 patients the anemia was associated with septicemia. Both patients improved gradually under iron and hygienic measures.

119. **Curability of Tuberculous Meningitis.**—Ovazza reports a case of what was assumed to be tuberculous meningitis in a boy of 4. After three months of serious symptoms an intercurrent varicella lasted a week or so, after which the symptoms gradually subsided and the child was up and about by the end of the sixth month, and by the end of the year seemed to be quite cured, intelligent and lively. He was in the hospital seven months. The temperature was high during the first ten days of the onset, but was always subnormal after that. Treatment was purely symptomatic, without lumbar puncture, merely ice to the head during serious symptoms, repeated small doses of calomel; twice an "abscess of fixation" was induced in the thigh for revulsion; an ether-iodoform pommade was applied sometimes to the head, and pills of iodoform were given occasionally, with small doses of potassium iodid.

Norsk Magazin f. Laegevidenskaben, Christiania.

Last indexed XLVI, page 1326.

120 (LXVII, No. 4.) Epidemi af poliomyelitis ant. acuta i Hvaler lægedistrikt sommeren 1904. Nannestad. 41 cases.
121 *Length of Survival of the Tuberculous in Norway.—Undersøgelser over livsvarigheden hos tæringssyge i Norge. P. F. Holst and others.
122 Studier over slambad (mud bath). P. A. M. Mellbye.
123 Clamp to Remove Small Foreign Bodies in Leg or Arm.—Tang til fjernelse af smaa fremmedlegemer i extremiteterne. S. A. Heyerdahl.
124 (No. 5.) *Medicolegal Features of Deaths from Burning.—Retsmedicinsk bedømmelse af indebrændte. F. Harbitz.
125 *Den respiratoriske therapi ved emfysem og bronchit. G. A. Haus.
126 How Long is Syphilis Virus Contagious?—Hvorlænge holder syfilisvirus'et sig smitsomt? R. Krefting.

121. **Length of Survival After Onset of Tuberculosis.**—A committee has been diligently at work since 1904 collecting data in regard to the after history of persons known to have pulmonary tuberculosis in Norway. Blank circulars were sent to physicians and reports were received in return of 2,005 cases of pulmonary tuberculosis, 905 men and 1,100 women. The findings are tabulated under various headings. They show among other points that out of 2,002 tuberculous patients whose history was traced for four years, 1,094 had died and 908 were still living, with 52.3 per cent. still able to keep at work. Out of 1,658 whose history was traced for nine years, 1,336 had died by the end of this time, and 322 were still alive, with 67.4 per cent. still able to work. The committee calls special attention to the surprisingly large proportion of the tuberculous with comparatively unimpaired earning capacity after four years. The data further show that the average survival after symptoms of tuberculosis were first observed ranged from 36 to 59 months.

124. **Medicolegal Features of Autopsies of Persons Burned to Death.**—Harbitz has been making a special study of this subject with much experimentation on the cadaver, as mentioned in an editorial Oct. 20, 1906, page 1305. He describes a special case in detail in which a healthy man was burned to death in a house, the fire not lasting over half an hour. He also gives the particulars of 2 cases in which the victim of a murder had been afterward burned. The various points for differentiation of a crime of this kind are summarized. As blisters may be produced after death, and as carbon oxid can diffuse through the tissues after death, too much stress should not be laid on these findings. The effect of the heat in causing strange attitudes, contracting the internal organs and bending the limbs back on themselves is described. In the first case reported the presence of 100 c.c. of a reddish fluid between the skull and the dura mater was shown to be due to the action of the fire and not to extraneous violence, as first supposed. See editorial in THE JOURNAL, July 28, 1906, page 276.

125. **Respiratory Treatment of Emphysema and Bronchitis.**—Haus traces the course of 6 patients under treatment by respiratory exercises. In the first case a man of 49 had bronchitis every winter. The bronchitis was accompanied with dyspnea and cyanosis when the patient was first seen. After 42 séances of respiratory therapy in the course of seven weeks the lung capacity increased from 3,000 to 4,000 c.c. while the dyspnea and cyanosis disappeared. The excursions of the thorax increased from 1 to 5 cm. He also relates his favorable experience with inhalations in treatment of catarrhal and other affections of the air passages, especially when combined with the respiratory exercises.

Books Received

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

PEDIATRICS, Edited by I. A. Abt, M.D., Assistant Professor of Medicine (Pediatrics Department), Rush Medical College; and ORTHOPEDIC SURGERY, Edited by J. Ridlon, A.M., M.D., Professor of Orthopedic Surgery, Northwestern University Medical School, and G. L. Bailey, M.D., Instructor in Orthopedic Surgery, College of Physicians and Surgeons. Being Vol. VII, Series 1906, of the Practical Medicine Series, Comprising Ten Volumes on the Year's Progress in Medicine and Surgery, under the Editorial Charge of G. P. Head, M.D., Professor of Laryngology and Rhinology, Chicago Post-Graduate School. Cloth. Pp. 267. Chicago: The Year-Book Publishers, 1906.

DIE BEHANDLUNG DER HERZKRANKHEITEN mittels kohlensaurer und elektrischer Bäder, Massage, Gymnastik, und Diätetik. Gemeinverständlich dargestellt von Dr. Paul C. Franze Arzt in Bad Nauheim. Paper. Pp. 61. Price, mk. 1.60. Munich: Verlag der Aerztlichen Rundschau, 1906.

DIE STELLUNGNAHME DES ARZTES ZUR NATURHEILKUNDE. Eine objektive Kritik von Naturheilkunde und Schulmedizin nebst Beiträgen zu einer biologischen Heillehre, von Dr. Esch in Rendorf. Paper. Pp. 22. Price, mk. 0.40. Munich: Verlag der Aerztlichen Rundschau, 1906.

FIRST REPORT OF THE CLINIC FOR THE TREATMENT OF COMMUNICABLE PULMONARY DISEASES, Department of Health, City of New York. Cloth. Pp. 46. Thomas Darlington, M.D., Commissioner of Health, John S. Billings, Jr., Director.

TRANSACTIONS OF THE TWENTY-EIGHTH ANNUAL MEETING OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION, held at Niagara Falls, N. Y., May 31 to June 1-2, 1906. Cloth. Pp. 347. New York: Published by the Association, 1906.